OUTCOMES OF CONTINUOUS RENAL REPLACEMENT THERAPY, SUSTAINED LOW EFFICIENCY DIALYSIS AND ACUTE PERITONEAL DIALYSIS IN HEMODYNAMIC UNSTABLE PATIENTS WITH ACUTE KIDNEY INJURY

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BY

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DECLARATION

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Dedicated

to

My Family

&

Teachers

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DR Abdul Majeed

ABBREVIATIONS

1.	AKI	Acute kidney injury
2.	AKIN	Acute Kidney Injury Network
3.	APACHE II	Acute Physiology And Chronic Health Evaluation II
4.	ATN	Acute tubular necrosis
5.	ARF	Acute renal failure
6.	ASAIO	American Society for Artificial Internal Organs
7.	AVVH	Accelerated venovenous hemofiltration
8.	ABG	Arterial blood gas
9.	ATN	Acute tubular necrosis
10.	PD	Peritoneal dialysis
11.	CAPD	Continuous ambulatory peritoneal dialysis
12.	CAVH	Continuous arteriovenous hemofiltration
13.	DDQ	Direct dialysate quantification
14.	EKRc	Corrected equivalent renal urea clearance (EKRc)
15.	HD	Hemodialysis
16.	ASAIO	American Society for Artificial Internal Organs
17.	CAVH	Continuous arterio-venous hemofiltration
18.	ICU	Intensive Care Unit
19.	CAVHD	Continuous arterio-venous hemodialysis
20.	CVVHD	Continuous veno-venous hemodialysis
21.	CVVHF	Continuous veno-venous hemofiltration
22.	SCD	Slow Continuos Hemodialysis
23.	EDD	Extended daily dialysis
24.	MAP	Mean arterial blood pressure
25.	SLED	Sustained low-efficiency dialysis
26.	IHD	Intermittent hemodialysis
27.	SRI	Solute removal indices
28.	DDQ	Direct dialysate quantification
29.	PUN	Plasma water urea nitrogen PUN

30.	SLEDD-f	Sustained low-efficiency daily diafiltration
31.	EKRc	Corrected equivalent renal urea clearance
32.	CHD	Continuous hemodialysis
33.	EDDf	Extended daily dialysis with filtration
34.	CPD	Continuous peritoneal dialysis
35.	dHD	daily hemodialysis
36.	CVVHDF	Continuous venovenous hemodiafiltration
37.	S-HDF	Sustained hemodiafiltration
38.	CRRT	Continuous renal replacement therapy
39.	PIRRT	Prolonged intermittent renal replacement therapy
40.	RRT	Renal replacement therapy
41.	EDHF	Extended daily hemofiltration
42.	SOFA	Sequential organ failure assessment
43.	IHD	Intermittent hemodialysis
44.	IPD	Intermittent peritoneal dialysis
45.	SLED-BD	Single-pass batch dialysis system
46.	CVVH	Continuous veno-venous hemofiltration
47.	CO	Cardiac output
48.	SVR	Systemic vascular resistence
49.	CVP	Central venous pressure
50.	MICU/SICU	Medical-Surgical Intensive Care Unit
51.	CCU	Cardiac care unit
52.	CKD	Chronic kidney disease
53.	CAD	Coronary artery disease
54.	COPD	Chronic obstructive pulmonary disease
55.	CHF	Congestive heart failure
56.	HTN	Hypertension
57.	ARDS	Acute respiratory distress syndrone
58.	MAP	Mean arterial pressure
59.	SBP	Systolic blood pressure
60.	DBP	Diastolic blood pressure
61.	CVP	Central venous pressure
62.	UF	Ultrafiltration

63.	dHD	Daily hemodialysis
64.	MOF	Multiple organ failure
65.	iHD	Intermittent hemodialysis
66.	CKD	Chronic kidney disease
67.	RIFLE	Risk, Injury, Failure, Loss, and End Stage Renal Disease
68.	KDIGO	Kidney Disease: Improving Global Outcome
69.	CAVH	Continuous arteriovenous hemofiltration
70.	CVVH	Continuous venovenous hemofiltration
71.	CAVD	Continuous arteriovenous hemodialysis
72.	CVVHD	Continuous venovenous hemodialysis
73.	PD	Peritoneal dialysis

ABSTRACT

Introduction: AKI is a fairly common occurrence in the ICU and the ideal mode of RRT for critically ill patients with AKI is a raging debate in nephrology. In this study, we investigated the potential impact of three of the major renal replacement therapies (CRRT, SLED and PD) used in ICU on mortality and renal related outcome measures.

Aims & Objectives: Outcomes of continuous renal replacement (CRRT), Sustained low efficiency dialysis (SLED) and acute peritoneal dialysis (PD) in hemodynamic unstable patients with acute kidney injury

Methods: We conducted a prospective observational study of 245 hemodynamically unstable patients with AKI in need of RRT. The primary outcome was survival at 14 day after RRT. The secondary outcome measures were 14 day-, 30 day-, all cause intrahospital mortality, days in hospital, cumulative fluid removal, total days on vasopressors/mechanical ventilation, correction of metabolic parameters.

Results: Two hundred and forty five patients, 99 in CRRT, 108 in SLED and 38 in acute PD were analyzed. All these patients required inotropes to maintain desired blood pressure. Sepsis was the most common immediate cause (75.5%), leading to AKI. Survival at 14 days after RRT was 40.4% in CRRT, 45.4% in SLED and 36.8% in PD, and the difference was not statistically significant. Secondary outcome measures were not different in between groups. Strong predictors of patient mortality in the study were the advanced age, overall disease severity (high SOFA score), need of mechanical ventilation, and underlying comorbidities like sepsis, CAD, CKD, CHF.

Conclusion: Our study showing comparable survival outcome in CRRT, SLED and acute PD gives evidence that either of the modalities can be adopted in hemodynamically unstable patients requiring RRT depending on the resources available.

Keywords: AKI, CRRT, SLED, PD, CAD, CKD, CHF

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INTRODUCTION

Acute kidney injury (AKI) grossly defined as a decrease in renal function over the period of hours to days has been one of the most common and intractable problems in severely ill patients in the intensive care unit (ICU). The prevalence of AKI in the ICU is variable but many studies put the frequency between 20% and >50% of patients around the world. [1] In the largest study to date, Hoste et al.[2] enrolled 1802 ICU patients from 33 countries and found that 57.3% of patients developed AKI. The mortality rate is reported to be approximately 50% or greater. The occurrence of AKI established as an independent risk factor for fatality, irrespective of the underlying condition[3-5] and also the development of end-stage renal disease.[6,7] Quite often, AKI is associated with multiple organ failure (MOF) which only makes the prognosis worse. Though AKI without MOF can be managed in the ward setting with similar approaches of RRT as that for chronic kidney disease (CKD) but AKI with MOF poses serious problems in terms of management and require a more vigorous and flexible approach to RRT.[8,9]

AKI is a complex metabolic dysfunction that arises from the interplay of many patient factors and environmental factors. Like any complex disorder, its etiology is multifactorial which may differ from patient to patient, by region and by resources. [10] The etiology and the mechanisms of AKI, hence, remain unclear. Various reasons such as infection, trauma and other problems that prompt the patient to be admitted into ICU could induce AKI or worsen any pre-existing condition of AKI.[11] Out of the diagnostic criteria proposed to establish AKI, the most important and widely used are Risk, Injury, Failure, Loss, and End Stage Renal Disease (RIFLE) [12], Acute Kidney Injury Network (AKIN) [13] and Kidney Disease: Improving Global Outcome (KDIGO).[14]

Renal replacement therapy (RRT) forms the foundation for treatment for AKI in critically ill patients.[15] RRT is used to replace the kidney

functions in both acute and chronic renal failure. About 70% of these patients with AKI require RRT as their primary treatment.[16]

Modalities of extracorporeal replacement of renal function (RRT) have been employed as a supportive treatment for AKI for nearly six decades now, the basic principles guiding the use of RRT, however, have not changed much.[17] Sixty years have passed since the first patient started treatment for chronic renal failure by repeated hemodialysis (HD) at the University of Washington Hospital in Seattle in March 1960[18] but over the years many variations in the technique and the clinical application of RRT have taken place in order to cater to the changing scenarios of kidney disease. With good success in reducing the mortality of stable patients with kidney disease (acute or chronic), the use of RRT and its more sophisticated treatment modalities have gradually moved into the ICU.[19] These enhancements in the technique have enabled clinicians to provide renal support to sicker and more critical patients in the ICU since 1980s.[20]

There are now many available options of RRT which may be divided into 4 groups: 1. peritoneal dialysis (PD), 2. IHD, 3. continuous therapies (CRRT), and 4. hybrid therapies (SLED).

The ideal RRT perform the functions of the native kidney by reproducing the physiological mechanisms of the kidney, purifying blood with similar qualitative and quantitative characteristics, be free or have minimal complications, tolerable to the patient, and restore and maintain normal fluid and electrolyte homeostasis while the renal function recovers.

PD, Intermittent hemodialysis (IHD) or continuous renal replacement therapies (CRRT) are more traditional modes of renal replacement therapy. The subtypes of CRRT are hemofiltration, hemodialysis, and hemodiafiltration. CRRT involves the following techniques:

- continuous arteriovenous hemofiltration (CAVH)
- continuous venovenous hemofiltration (CVVH)

- continuous arteriovenous hemodialysis (CAVD),
- continuous venovenous hemodialysis (CVVHD), and
- hemodiafiltration.

Newer modes which have been recently developed are prolonged intermittent renal replacement therapy (PRRT) and sustained low-efficiency daily dialysis (SLEDD).[21]

These 4 groups of RRT differ in the method of delivery, clinical efficiency, duration of session, indications of usage, and patient tolerability. The availability of these modalities allows nephrologist to provide which best fit to the scenario like hemodynamic stability, affordability, metabolic conditions, target solutes and time constraints (intermittent, continuous, or extended intermittent).[22] There are certain clinical situations in which only a particular therapy is indicated (e.g., CRRT in critically ill patients with cardiovascular instability).[23]

PD: Peritoneal dialysis (PD) is technically the simplest, cheap, bedside modality of RRT and is still commonly used worldwide. Requires no vascular access and anticoagulation but had some disadvantages like inability to do in patients with recent abdominal surgery, slow solute clearance, and sometimes technical failure of the procedure. Other problems include blockage of dialysate flow, leakage from tubing joints, loss of protein, increases sugar levels, peritonitis and limited clearance function including fluid and solutes. PD is the preferred treatment modality for AKI in pediatric practice.[22] Two types of PD are used currently, APD automated peritoneal dialysis and CAPD (continuous ambulatory peritoneal dialysis.

IHD: Hemodynamically stable patients with renal dysfunction are treated with intermittent hemodyalisis (IHD), whereby relatively short (3 to4 h) dialysis sessions may be performed every day or every other day. IHD requires vascular access via AV fistula or nontunnelled or tunnelled catheter with blood flow rates about 200ml/min and dialysate flow at around 500 ml/min and is highly efficient in solute clearance.

Due to high amount of fluid shifts which can result in hypotension, IHD cannot be used in hemodynamically unstable patients.

CRRT: Critically ill patients with AKI who are haemodynamically unstable are treated by CRRT, as it allows for more precise control of intravascular volume, more efficient clearance of solute and fluid overload, swifter and accurate correction of metabolic acidosis, and allows for nutritional support as these patients can tolerate high volume IV infusions well.[22] Multiple studies have shown benefits on CRRT over IHD in terms of renal recovery outcome in patients with AKI.[25] CRRT involves the slow and constant removal of water and solutes from the plasma with dialysate flow rates 17-35 ml/min and blood flow rates less than < 200 ml/min, it results in very small fluid fluctuations making it the preferred modality for managing unstable patients.[24] It also causes minor or no changes is intracranial pressure, making it a choice in patients with concomitant intracranial hypertension.

SLEDD: Sustained low-efficiency dialysis (SLED) is recently introduced emerging mode, which combines the advantages of IHD with those of CRRT, hence 'hybrid', and has been accepted as reliable and safe alternative therapy to CRRT in hemodynamically unstable patients with AKI.[25] This technique uses the classic dialysis hardware but at low blood and dialysate flow rates, for longer durations than IHD (6 to 12 h/day). Usually the dialysate flow rate is 300ml/min and blood flow rate is kept around 200 ml/min allowing for gradual solute and fluid removal with small fluctuations in body fluid levels, making it tolerable to hemodynamically unstable patients. Additionally it gives excellent solute clearance, comparable to CRRT [22], thus eliminating the need for expensive CRRT machines, costly dialysate solutions and needs very little supervision, hence can be carried out by staff with minimum training. It can be provided intermittently, hence frees the patient for any diagnostic or therapeutic procedures that may be required.

Table 1: A Comparison between various modes of RRT				
MODE OF RRT	**IHD**	**PD**	**CRRT**	**SLEDD**
Mechanism of solute removal	Intermittent solute removal by diffusion (rapid)	Removal of solute using peritoneum as filtration membrane	Continuous removal (24hr ultrafiltration) of small to middle molecules diffusion, convection or both.	Slow/sustained low efficiency daily dialysis of small to middle solute molecules by diffusion
Duration	3-4hrs/day	Intermittent/ continuous	24hrs/day	6-12hrs/day
Dialysate flow rate	>/= 500 ml/min	2-3 litres per dwell or 2-4 l/hr	17-34 ml/min	300 ml/min
Vascular access	AV fistula or nontunnelled or tunnelled catheter	Not needed	Nontunnelled or tunnelled catheter	AV fistula or nontunnelled or tunnelled catheter
Blood flow rate	> 200 ml/min	Not required	< 200 ml/min	200 ml/min
Hemodynamic stability	Poor	Good	Good	Fair – Good
Compatible with extracorporeal life support	No	No	Yes	Yes
Intracranial pressure	Increases	Some increase	Usually no change	Can increase
Serum concentration of drugs with renal clearance	Major fluctuations	Small drop in serum levels during a session, but overall weekly loss in CAPD is higher than in IHD	Least fluctuation	Some fluctuation
Compatible with supporting large volume infusions (antibiotics, nutrition, etc.)	No	No	Most compatible	Would need to be daily and longer sessions
Efficiency	High	Low-Moderate	Low – Moderate	Moderate
Cost	Low	Low	High	High
Anticoagulation needed	Not needed	Not needed	Important	Not usually needed

Mobilisation	Most compatible	Compatible in CAPD	Not compatible	Could be compatible if done at night/rest time
Used in	In ambulatory CRF patients, hyperkalemia	Critically ill, problems with vascular access, paediatric population, significant hypo/hyperthermia	Unstable and non-ambulatory critically ill patients, hyperkalemia, uremia, sepsis	Critically ill patients
Complications	Hypotensive episodes	Peritonitis, catheter misplacement, catheter block, hyperglycaemia	Hypotensive episodes	Air embolism, hypothermia
Adapted and modified from Fathima et al. [25] and Rafi et al. [26]				

For comparison between CRRT and PD **Jaryal et al. (2017)** [27] **c**onducted a retrospective analysis over one year at a tertiary care institute in Northern India. They concluded that both modalities show comparable survival outcome in AKI and suggested that either of the modalities can be adopted in hemodynamically unstable patients requiring RRT depending on the resources available. In a pilot study **George at al.**[28] compared the outcomes between CVVHDF with continuous PD in critically ill patients and reached a conclusion that CPD is a cost effective alternative to CVVHDF and differences in metabolic and clinical outcomes are not significant.

In a comparison between SLED and CRRT in four different ICU s in Toronto, **Kitchlu et al.**[29] found similar clinical outcomes for patients treated with SLED and CRRT. They concluded SLED was an acceptable alternative form of renal support in hemodynamically unstable patients with AKI. **Fieghen et al** [30] also compared SLED with CRRT in critically ill patients with AKI, and concluded that the administration of SLED is feasible and provides comparable hemodynamic control to CRRT. **Kovacs et al.**[31] performed a meta-analysis of 18 studies with 1564 patients in total, and concluded that

there is no clear advantage of continuous renal replacement over SLED in the hemodynamically unstable patient. They asserted that both SLED and CRRT are safe and effective means of treating AKI inpatients with hemodynamic instability.

One study comparing PD and extended hemodialysis was carried by **Ponce *et al*.**[32], comparing the results of high volume peritoneal dialsysis and extended hemodialysis and found no significant difference in the mortality rate, renal recovery, need of chronic dialysis, and median ICU. **Datt et al.**[33] also found similar results in comparison between acute PD and SLEDD in critically ill patients by concluding that IPD is comparable to SLED in terms of correction of metabolic and clinical derangements.

Ponce et al.[34] compared continuous peritoneal dialysis compared with daily hemodialysis in crtically ill patients with AKI and concluded that high doses of CPD provided appropriate metabolic and pH control, with a rate of survival and recovery of renal function similar to that seen with daily HD.

In a meta-analysis comparing results from IHD, CRRT and SLEDD, **Nash et al.**[35] did not find a definitive advantage for any RRT modality over others in regards short-term patient or kidney survival.

All CRRT, SLED and PD are slow continuous therapies with advantage of convective clearance and hemodynamic tolerability. In critically ill patients with hemodynamic instability, one can choose from either CRRT or acute PD or SLED in patients who need RRT and have hemodynamic instability because of their inherent virtue of causing least hemodynamic compromise.

Most of the studies comparing CRRT, IHD, and very few with acute PD have shown comparable outcomes in different modalities. Debate is still raging over the choice of intermittent versus continuous therapies for critically ill with acute kidney failure. [36] Single center data and meta-analysis demonstrate conflicting results[37-39] and the two most recent

large adult trials failed to show benefit of continuous therapy over intermittent.[40,41]

The efficacy of PD, CRRT and SLED has been established in multiple studies till date with many studies comparing two of the modalities with each other. To our knowledge, till the date of inception of this study, there was no study comparing the outcome in all three modalities with each other. With this prospective study, we tried to elucidate further the potential impact of initial choice of renal replacement modality by studying a the outcome in all three modalities (PD, CRRT, SLED) in cohort of critically ill patients with AKI in Nephrology and medical intensive care units of Dayanand Medical College and Hospital Ludhiana.

AIMS & OBJECTIVES

Outcomes of continuous renal replacement (CRRT), Sustained low efficiency dialysis (SLED) and acute peritoneal dialysis (PD) in hemodynamic unstable patients with acute kidney injury.

REVIEW OF LITERATURE

Support for ailing organs was one of the basic tenets of ancient medicine in West or the East but was only attempted via means available. Galen is reported to have used artificial respiration in Roman times and George Poe in the beginning of 20th century in 1908 but, support of the failing kidney began only in 1913. Two researchers are particularly credited repeatedly in the field of renal replacement **John J. Abel** and **W. J. Kolff**, as touted as the forefathers of modern dialysis. The term 'vividiffusion' was first coined in a paper presented before the Association of American Physicians in 1913 in which the blood of animals was cleansed of metabolic intermediates.[42] This vivi-diffusion was achieved using arterial cannulation in a dog drawing blood which was then directed through multiple branching glass tubes to pass across a series of cellodin dialysis membranes and then back to the vasculature via a venous cannula. Hirudin was used for anticoagulation. This concept was also independently developed by **Dr. Kolff** in the Netherlands which led the first such apparatus available for clinical use.[43] Kolff's drum dialyzer consisted of a drum wrapped with cellophane tubing through which blood was passed, and the drum rotated in a bath of dialysate. This apparatus was used prominently as late as the 1950s during the Korean war,[44] but modern dialysis today is based on principles and design made by **Nils Alwall** which uses two cylinders between which blood-filled cellophane tubing was compressed and the dialysate was passed in the opposite direction to blood (countercurrent) between the two cylinders.[45]

The peritoneum, touted as the 'living dialyzer', was first used by **Tracey J. Putnam** in 1923 in a series of experiments involving cats which were given peritoneal dialysis.[46] As a meticulous researcher, Putnam made a complete evaluation of the spent dialysate and was surprised to find that the peritoneal membrane was remarkably good for the purpose of exchanging fluid and metabolic solutes in the living animal. However, despite this early success PD wasn't commonly used in clinical practice until the 1940s when **Jacob Fine (1946)** presented four cases at the

American Surgical Association.[47] In 1959, **Richard Ruben** successfully used PD for a patient with chronic renal failure who survived for 6 months in San Francisco.[48] In 1962 **Fred Boen** described the first automatic cycling PD machine, by modifying an apparatus previously used in gastrodialysis, and an indwelling peritoneal access fitting.[49] Widespread use of peritoneal dialysis was possible only after improvements in design of the dialysis catheter used which was accomplished by **Quinton (1964)**[50] and later by **Tenckhoff** who in 1968 came up with the indwelling peritoneal catheter in a paper titled 'Bacteriologically safe peritoneal access device' which is today known as Tenchkoff catheter**.**[51] This was the most far-reaching development in the field of PD.

In 1970, **Tenckhoff and Curtis** published a report on 19 patients treated by self-PD for up to 4 years, 16 of them were treated at home. They reported 16 episodes of peritonitis, an incidence of 0.59% of all dialyses, and 3 deaths. PD was seen as a good alternative for patients living alone, children, and patients with cardiac disease.[52] In 1972, Tenckoff's team reported the first automatic peritoneal system using reverse osmosis to sterilize dialysate. This was simple, relatively low cost, and delivered a continuous supply of sterile pyrogen-free dialysate from tap water and sterile concentrate.[53] It was developed commercially by the Physiocontrol Company, but PD was revolutionized in 1976 by the development of continuous ambulatory peritoneal dialysis (CAPD).[54]

Continuous renal replacement therapies of today owe their origins to the 1960s, with early descriptions of pump-assisted continuous arteriovenous hemofiltration (CAVH) by **Scribner**.[55,56] On March 9, 1960 Clyde Shields, a Boeing machinist dying from chronic renal failure, became the first patient to receive HD at University Hospital in Seattle. Scribner identified the problem with resistance in the tubing and formation of bubbles when rewarmed blood was returned to the patient. **Wayne Quinton** developed the technique of using heat to bend Teflon tubing to make cannulas to fit the patient's anatomy and

overcome the luminal resistance and the u-shaped piece of tubing to connect them between dialyses. Additionally the Teflon had anti-stick properties which reduced the resistance and incidence of thrombosis. **David Dillard**, a pediatric cardiac surgeon, inserted the shunt in Clyde. This first dialysis lasted 76 hours using twin Skeggs Leonards dialyzers, a blood flow of 100-130 mL/min, and a continuous flow of dialysate from a Sears-Roebuck freezer holding 300 litres of dialysate at 0°C, a technique developed originally for treating acute renal failure patients.**Error! Bookmark not defined.** The treatment was so successful that Scribner presented the paper at the ASAIO annual meeting in Atlantic City. The paper describing intermittent dialysis became one of the most frequently cited papers in entire nephrology[57] and was also accompanied by detailed description of the shunt.[58] Three more patients started treatment in March, April, and June, respectively.

In 1960 **Fred Kiil,** a Norwegian Urologist, described a 'parallel-flow artificial kidney in plastics'. In 1961, Scribner visited Copenhagen, where **Claus Brun** showed him a large flat plate dialyzer developed by a Fred Kiil. It had a low internal resistance, hence eliminated the need of a blood pump, and was intended for use with the new cellulosic membrane Cuprophane.[59]

The Kiil dialyser was adapted and used in **Seattle Artificial Kidney Center (SAKC)** which opened on January 1, 1962 as 3-bed dialysis center with nurses providing overnight dialysis twice weekly using cooled dialysate from tanks manufactured by a local soft ice-cream machine manufacturer.60] In 1970, a report on 8 years' experience at the SAKC, now renamed the Northwest Kidney Center (NKC), was published that included details of the first 175 patients. Overall patient survival was 90% at 1 year, 85% at 2 years, and 61% at 5 years, but in patients aged 56 or older, 2-year survival was only 40%.[61]

In his ASAIO presidential address in 1961 **Charles Kirby**, a vascular surgeon, suggested the concept of home HD. He was the first to do so.[62] **John Merrill** and his group, in Boston, practiced the concept of

home HD by early 1964. They used the twin-coil dialyzers at home, 5 hours twice a week, in 4 male patients assisted by their wives and occasionally attended by a physician or nurse.[63] In October 1964, **S Shaldon**, in London, became the first to use overnight home HD [64,65] and the Seattle Centre employed a similar schedule of 6 to 8 hours overnight thrice weekly the reports of which were published in 1964 and 1966.[66,67] By 1972, the NKC almost completely switched to home HD with over 90% of the 130 NKC patients being treated at home.[68]

In 1965, **Maher and Schreiner** had published an important paper dealing with the then recognized complications of dialysis.[69] Serum hepatitis started appearing in dialysis units around the same time, resulting in deaths among both patients and staff. Outbreaks occurred at the NKC[70] Downstate Medical Center in Brooklyn[71] and many other units. Awareness of this infectious risk led to adoption of precautions, and when Australia antigen screening became available in 1965, the epidemiology of the problem became better understood.[72] Even so, it was a number of years before isolation and other precautions, identification of carriers, and development of a vaccine against hepatitis B virtually eliminated this problem.

In 1967 **Lee Henderson** and colleagues published their first report of laboratory tests on new synthetic membranes for diafiltration.[73] This was followed by animal and human studies,[74-76] leading to the concept of convective clearance and eventually to the clinical use of **hemodiafiltration**, a process in which whole blood is first diluted with a physiologic electrolyte solution and then ultrafiltered across a membrane to convectively remove solutes and excess water, primarily in the acute setting in the United States.

Peter Kramer treated a patient with continuous hemofiltration in May, **1977**. One of the vascular catheters was inadvertently placed into the femoral artery, and it was his idea to put a hemofilter between the arterial and venous blood line, observing that, as in the glomeruli, the strength of the heart was sufficient to produce ultrafiltrate.[77] He called

this system "continuous arterio-venous hemofiltration (CAVH)".[78] **Kramer** became the first to report the use of continuous hemofiltration in Germany in 1977.[79] Others, including **Henderson** [80] and **Kopp** [81] had studied hemofiltration in animals and as an alternative to dialysis in chronic renal failure, but it was really Peter Kramer's report to ASAIO that stimulated many of us to undertake the serious evaluation of continuous arteriovenous hemofiltration (CAVH) in acute renal failure in the Intensive Care Unit (ICU).

Babb and Scribner (1975) developed the dialysis index that took into account body surface area, residual renal function, vitamin B 12 clearance, the membrane, and ultrafiltration as a measure of dialysis adequacy[82] but the concept of Kt/V soon overtook the index method as a valuable parameter in the 1980s. **Babb et al** published their middle molecule hypothesis in 1981.[83]

In April 1982 the use of CAVH in intensive care patients was approved by the Food and Drug Administration in the USA. At the ASAIO Meeting in 1982, **Peter Kramer**, from Göttingen, Germany presented a paper describing the use of arteriovenous hemofiltration in the management of acute renal failure.[84] He described his experience of attaching a microporous hemofilter to the femoral artery and vein, and flowing blood through it at around 100 mL/minute. As a large volume of plasma filtrate (extracellular fluid) poured out, he replaced it with an infusion of electrolyte solution which did not contain urea, creatinine, potassium, or other molecules normally cleared by the kidney. He explained that this could be done continuously, avoiding the volume shifts and other problems of intermittent hemodialysis. For those in the audience who cared for patients with anuric acute renal failure, this was an epiphany of thunderbolt proportions.

In 1979 CVVH (continuous veno-venous hemofiltration) was employed in **Cologne**, in patients with ARF after cardiac surgery. The advantage was that any desired filtrate volume could be attained and uraemia controlled, even in hypercatabolic patients without additional dialysis.

The term CVVH was first used in literature by **Bischoff and Doehr in 1982.**[85]

Geronemus and Schneider (1984) increased the efficacy of CAVH in eliminating low molecular substances such as creatinine and urea by perfusing the external port of the filter with about 1 litre dialysis fluid.[86] They called their system continuous arterio-venous hemodialysis (CAVHD). **Tam et al** (**1988)**[87] further increased efficiency by employing a blood pump, introducing continuous veno-venous hemodialysis (CVVHD).

In 1986, the term continuous renal replacement therapy was applied to all continuous modalities of treatment for renal dysfunction.[87]

Peachy et al (1988) controlled the accuracy of dialysate in-and outflow with two volumetric infusion pumps.[88] Better control over fluid removal was thereby achieved. The combination of both methods, hemofiltration and hemodialysis by continuous hemodiafiltration, is usually performed using the arterio-venous route described by **Ronco et al. 1987**[89]; **van Geelen et al. 1988.**[90] During the process of hemofiltration the filter is also perfused by dialysing solution. The flow of about 1 L/h is generated by gravity.

Canaud described continuous veno-venous hemofiltration (CVVHF) for adults in 1988[91] **and Yorgin** modified the same to be used in children in 1990.[92]

In 1988 **Kudoh et al.** publishied two papers explicating first the theoretical basis of a new form of treatment in AKI which they called Slow Continuos Hemodialysis (SCD) and then its results in animal experiments.[93,94] They intended to combine the merits of PD or continuous hemofiltration with those of hemodialysis (HD), and dealt with the problems of volume control and solute removal separately. They treated five acutely uremic dogs were treated for 9 hours by means of slow continuous hemodialysis using this apparatus, and concluded that slow continuous hemodialysis could be a better

alternative to peritoneal dialysis, continuous hemofiltration or conventional hemodialysis in order to treat acute renal failure in critically ill patients, in terms of solute removal, volume control and the effects on hemodynamics.

The same year **Tam et al. (1988)** described slow continuous hemodialysis (SCHD) as a means of treating difficult and complicated cases of oliguric acute renal failure. They used a double-lumen central venous catheter to gain access to the circulation and a BSM 22 blood systems module to treat 16 patients with AKI in the intensive care unit, closely supervised by a trained nephrologist. They reported that SCHD was not associated with any serious accidents or complications, and was tolerated well by even the most critically ill and hemodynamically unstable patients.[87]

Storck et al. 1991 showed that mortality correlates closely with the filtrate volume in patients with multiple organ failure. The necessary filtrate volume was not attainable with CAVH. In its original form, "a simple method for treatment of over hydrated patients resistant to diuretics"[95], provides outstanding treatment, and in many situations may be life-saving.

Kumar et al. (2000)[96] described what they called extended daily dialysis (EDD) for treatment of AKI in ICU patients. Enrolling 42 patients they compared the outcomes in EDD (25 patients) with CVVH (17 patients). The 25 patients in EDD group received 367 treatment days, while 17 patients in CVVH group were treated for 113 days. Median treatment time per day was 7.5 hours for EDD (range, 6 to 8 hours, 25th to 75th percentile) versus 19.5 hours for CVVH (range, 13.4 to 24 hours; $P < 0.001$). Mean arterial blood pressures (MAPs) did not differ significantly for patients treated with EDD when measured predialysis (median MAP, 70 versus 67 mm Hg for CVVH; $P = 0.078$), midway through daily treatment (70 versus 68 mm Hg for CVVH; $P = 0.083$), or at the end of treatment (71 versus 69 mm Hg for CVVH; $P = 0.07$). Net daily ultrafiltration was similar for the two treatment

modalities (EDD, median, 3,000 mL/d; range, 1,763 to 4,445 mL/d; CVVH, 3,028 mL/d; range, 1,785 to 4,707 mL/d; P = 0.514). Anticoagulation requirements were significantly less for patients treated with EDD (median dose of heparin, 4,000 U/d; range, 0 to 5,800 U/d versus 21,100 U/d; range, 8,825 to 31,275 U/d for patients treated with CVVH; P < 0.001).

They observed that EDD eliminated the need for constant supervision of the dialysis machine by a subspecialty dialysis nurse, allowing one nurse to manage more than one treatment, hence concluded that EDD was well tolerated by the majority of patients, offered many of the same benefits provided by CVVH, and was technically easier to perform.

Ronco et al. (2000)[97] carried out an early prospective RCT enrolling 425 patients, with a mean age of 61 years, in intensive care who had acute renal failure. Patients were randomly assigned ultrafiltration at 20 mL/hr/kg (group 1, n=146), 35 mL/hr/kg (group 2, n=139), or 45 mL/hr/kg (group 3, n=140). The primary endpoint was survival at 15 days after stopping haemofiltration and additional parameters assessed were recovery of renal function and frequency of complications during treatment. They found that survival rates in group 1 were significantly lower than in groups 2 (p=0.0007) and 3 (p=0.0013) but groups 2 and 3 did not show any significant difference (p=0.87). In addition, hospital survival was significantly higher both in Group 2 (57%) and Group 3 (58%) versus Group 1 (41%). Among survivors, full recovery of renal function was seen in 95%, 92%, and 90% in groups 1, 2, and 3, respectively. They observed that though the mortality rate was high in critically ill patients, increase in the rate of ultrafiltration improved survival significantly and recommended that ultrafiltration dose should adjusted to body weight and should reach at least 35 mL h(-1) kg(-1).

Marshall et al (2001)[98] presented their experience with a hybrid technique named sustained low-efficiency dialysis (SLED), at a single center in which standard IHD equipment was used but with reduced

volumes of dialysate and slower blood flow rates. In 37 critically ill patients in whom IHD had failed or been withheld, 147 SLED treatments were performed out of which 51 were terminated prematurely, either due to uncorrected hypotension or clotting of blood in the circuit. The overall mean SLED treatment duration was 10.4 hours. During most SLED treatments, blood pressure was maintained, allowing the achievement of stipulated ultrafiltration goals in most cases with an overall mean shortfall of only 240 mL per treatment. Direct dialysis quantification in nine patients showed a mean delivered double-pool Kt/V of 1.36 per (completed) treatment. Mean phosphate removal was 1.5 g per treatment. During 25 treatments small drop in potassium and/or phosphate levels was seen which required supplementation. Observed hospital mortality was 62.2%, not significantly different from the mortality expected from prediction by the APACHE II scoring system. They called SLED viable alternative to traditional CRRT in critically ill patients in whom IHD has failed. To determine dialysis dose and to better describe the urea kinetics

Marshall et al (2002)[99] published another study of nine critically ill patients with ARF during a single SLED treatment kinetics during treatment. The mean APACHE II score was 28.9 and mean weight was 92.5 kg. Delivered Kt/V and SRI (Solute removal indices) were determined for one SLED treatment per patient by the DDQ (direct dialysate quantification) reference method combined with an equilibrated postdialysis plasma water urea nitrogen (PUN) concentration and also by several alternative blood- and dialysate-based methods. Mean Kt/V determined by the reference method was 1.40, Mean SRI and EKR by the reference methods were 0.61 and 24.8 mL/min respectively. In conclusion, SLED delivers a high dose of dialysis with minimal associated urea disequilibrium and can be quantified by Kt/V, SRI, and EKR from blood-based methods using single-pool urea kinetic models.

Another paper by **Marshall et al (2004)**[100] reported about sustained low-efficiency daily diafiltration (SLEDD-f) which was instituted by ICU

nursing personnel. Using countercurrent dialysate flow at 200 ml/min and on-line haemofiltration at 100 ml/min for 8 h/day either daily or every alternate day, 56 SLEDD-f treatments were given to 24 critically ill patients with AKI. The entire process was managed by ICU nursing personnel with no need for supervision. Clinical data, patient outcomes and solute levels were noted down. Kt/V, corrected equivalent renal urea clearance (EKRc) and theoretical Kt/V(B12) were also calculated. No cases of hypotension or other complication were seen during the dialysis. Observed mortality was 46%, which was almost same as that predicted from the APACHE II score. Excellent. Electrolyte control was achieved. Kt/V per completed treatment was 1.43+/-0.28 (0.96-2.0). Kt/V(B12) per completed treatment was 1.02+/-0.21 (0.6-1.38). EKRc for patients was 35.7+/-6.4 ml/min (25.0-48.2). The authors concluded that SLEDD-f yielded stable renal replacement therapy and good clinical outcomes, with no significant difference from CRRT. Moreover, logistically administering SLEDD-f was much easier and solute clearance is as good as CRRT or IHD.

Shiffl et al. (2002)[101] carried out a prospective study of 160 patients with acute renal failure without severe hemodynamic instability to compare the effect of daily intermittent hemodialysis with conventional (alternate-day) intermittent hemodialysis on survival, which was the primary end point. They observed that patients with daily hemodialysis showed better control of uremia, fewer hypotensive episodes, and rapid resolution of acute renal failure (mean [9±2 vs. 16±6 days; P=0.001) than did patients who received conventional hemodialysis. The mortality rate, according to the intention-to-treat analysis, was 28 percent for daily dialysis and 46 percent for alternate-day dialysis (P=0.01). In a multiple regression analysis they asserted that less frequent hemodialysis (on alternate days, as opposed to daily) was an independent risk factor for death. They concluded that Intensive hemodialysis reduces mortality without increasing hemodynamically induced morbidity.

Kumar et al. (2004)[102] presented a study of 54 ICU patients with ARF over 2 years who were treated with either continuous hemodialysis (CHD) or Extended Daily Dialysis (EDD). There were no significant differences in baseline demographic characters, oliguria (64% in CHD vs 73% in EDD), need of mechanical ventilation (93% CHD vs 81% EDD) or mean APACHE II scores at the time of randomization. The measurement of Mean arterial pressures during treatment was between 70 and 80 mmHg in both groups, and average daily serum electrolyte levels fell within normal ranges for both groups. Average daily fluid input and output were 5.8 ± 3.3L and 6.0 ± 3.2 L for CHD vs. 3.3 ± 2.6 and 3.0 ± 1.7 L for EDD after exclusion of data from 2 burn patients. Anticoagulation in form of heparin was used in both at rates of 1080 U/hour for CHD and 643 U/hour for EDD, p=0.02. Significant difference was seen in anticoagulation free treatments between the two groups (43% EDD vs. 21% CHD p<0.001). Similarly nearly half (51%) of CHD treatments showed clotting of the dialyzer or circuit while only 22% of EDD treatments showed this complication. (p<0.001). The authors suggested that EDD is a safe, effective alternative to CRRT that offers comparable hemodynamic stability and excellent small solute control.

Berbece et al. (2006)[103] performed an observational, prospective pilot study describing the outcome of sustained low-efficiency daily dialysis (SLED) in a Toronto hospital. In comparing SLED (23 patients, 165 treatments) with CRRT (11 patients, 209 days) they measured the cost effectiveness, anticoagulation, and efficacy in small solute removal. CRRT patients were anticoagulated with either heparin or citrate, while heparin or saline flushes were used in SLED. The weekly were $1431 for SLED, $2607 for CRRT with heparin, and $3089 for CRRT with citrate. Sixty-five percent of SLED treatments were heparin-free; filter clotting occurred in 18% of heparin treatments and 29% of heparin-free treatments (NS). Weekly Kt/V was significantly higher for SLED (8.4±1.8) and time-averaged serum creatinine was lower; equivalent renal clearance (EKR_{jc}) was 2976 ml/min for SLED, similar to that for

CRRT. In summary, SLED may be routinely performed without anticoagulation; it provides solute removal equivalent to CRRT at significantly lower cost.

Kielstein et al (2004)[104] carried out a randomized trial by treated 39 ventilated critically ill patients with oliguric AKI with either continuous venovenous hemofiltration (CVVH; n=19; age, 50.1±3.2 years; Acute Physiology and Chronic Health Assessment II [APACHE II] score, 32.3±1.2; 79% sepsis) and a substitution fluid rate of at least 30 mL/kg/h for 24 hours or with extended dialysis for 12 hours (n=20; age, 50.8±3.6 years; APACHE II score, 33.6±1.0; 85% sepsis). All hemodynamic parameters were monitored invasively by means of an indwelling arterial catheter. Average mean arterial blood pressure, heart rate, cardiac output, systemic vascular resistance, and catecholamine dose were not significantly different in both therapies. Urea reduction rate was similar with extended dialysis compared with CVVH therapy (53%±2% versus 52%±3%; P=not significant) despite an average rate of substitution fluid with the latter of 3.2±0.1 L/h. This was corroborated by the finding of similar amounts of urea eliminated in the collected spent total hemofiltration and dialysis fluid. Correction of acidosis was accomplished faster with extended dialysis than CVVH, and the amount of heparin used was significantly lower with extended dialysis ($P < 0.01$). Conclusion: Extended dialysis combines excellent detoxification with cardiovascular tolerability, even in severely ill patients in the ICU. The technically simple dialysis system used offers flexibility of treatment time.

Baldwin et al (2007)[105] conducted a small randomised controlled trial on 16 patients with AKI in an ICU. The 16 patients were randomised to three consecutive days of treatment with either CVVH (8) or extended daily dialysis with filtration (EDDf) (8) and small solute, electrolyte and acid–base control were observed. They found no significant difference between the two therapies in terms of urea or creatinine levels over 3 days. Prior to treatment, out of 80 electrolyte measurements taken 19 were abnormal. Following treatment all values were corrected, except

for one patient in the CVVH group who developed hypophosphataemia (0.54 mmol/l) at 72 h. After 3 days of treatment, there was a mild but persistent metabolic acidosis in the EDDf group compared to the CVVH group (median bicarbonate: 20 mmol/l vs. 29 mmol/l: p = 0.039; median base deficit: –4 mEq/l vs. –2.1 mEq/l, p = 0.033). The authors found that both CVVH and EDDf achieved similar control of urea, creatinine and electrolytes though acidosis was better controlled with CVVH.

Gabriel et al. (2009)[106] performed a prospective study to compare the efficiency of continuous peritoneal dialysis (CPD), with daily hemodialysis (dHD) in AKI. The primary outcome assigned was hospital survival rate, while renal recovery, metabolic correction, acid–base balance, and fluid controls were secondary endpoints. A total of 120 patients with acute tubular necrosis (ATN) were assigned to receive CPD or dHD in a tertiary-care university hospital in Sao Paulo, Brazil. Of total, 60 were treated with CPD (G1) and 60 with dHD (G2). The two groups were similar at the start of RRT with respect to age, sex, sepsis, shock, severity of AKI; APACHE II score, pre-dialysis blood urea nitrogen and creatinine. In Group 1, weekly delivered Kt/V was 3.59 ± 0.61, and in Group 2, it was 4.76 ± 0.65 ($p < 0.01$). The two groups were similar in metabolic and acid–base control. The patients' BUN, serum creatinine, bicarbonate, and pH levels stabilized after 3 or 4 sessions of dialysis (after 4 sessions, BUN < 55 mg/dL: 46 ± 18.7 mg/dL vs 52 ± 18.2 mg/dL; pH: 7.41 vs 7.38; bicarbonate: 22.8 ± 8.9 mEq/L vs 22.2 ± 7.1 mEq/L). Duration of therapy was longer in G2 (5.5 days vs 7.5 days; p = 0.02). Despite the delivery of different dialysis methods and doses, the survival rate did not differ between the groups (58% in G1 vs 52% in G2), and recovery of renal function was similar (28% vs 26%). They conluded that CPD can be considered an alternative to other forms of RRT in AKI as high doses of CPD provided appropriate metabolic and pH control, with a rate of survival and recovery of renal function similar to that seen with dHD.

Masanori Abe (2010)[107] studied 60 critically ill patients with AKI who required RRT in the intensive care unit (ICU) of Nihon University

Nerima Hikarigaoka Hospital, Tokyo, Japan. These patients were treated with either continuous venovenous hemodiafiltration (CVVHDF) or sustained hemodiafiltration (S-HDF). The former was performed by administering a post-filter replacement fluid at an effluent rate of 35 mL/kg/h, and the latter was performed by administering a post-filter replacement fluid at a dialysate-flow rate of 300–500 mL/min and was performed every day during the treatment. The baseline characteristics of the patients in the two treatment groups were similar. There were no significant differences in the total numbers of treatment days, sessions or number of treatments per patient between the two groups. The mean duration of treatment hours per day in the S-HDF group was significantly lower than that in the CVVHDF group. The flow rate and total volumes of the dialysate in the S-HDF arm were significantly higher (dialysate volume, 20.2 L/session in the CVVHDF arm versus 177.0 L/session in the S-HDF arm; $P < 0.0001$). There was no significant difference between the two groups in terms of survival at 30 days or discharge from the ICU, the primary study outcome, which was 70% after CVVHDF and 87% after S-HDF. However, S-HDF was found to significantly improve the hospital-survival rate (CVVHDF 63% and S-HDF 83%, $P < 0.05$). The number of patients who showed renal recovery at the time of discharge from the ICU and the hospital and the duration of the ICU stay significantly differed between the two treatments ($P < 0.05$). Although there was no significant difference between the mean number of treatments performed per patient, the mean duration of daily treatment in the S-HDF group was 6.5 1.0 h, which was significantly shorter. Although the total convective volumes—the sum of the replacement-fluid and fluid-removal volumes—did not differ significantly, the dialysate-flow rate was higher in the S-HDF group. Our results suggest that in comparison with conventional continuous RRT, including high-dose CVVHDF, more intensive renal support in the form of postdilution S-HDF will decrease the mortality and accelerate renal recovery in critically ill patients with AKI.

Feighen (2010)[30] examined the relative hemodynamic tolerability of sustained low efficiency dialysis (SLED) and continuous renal replacement therapy (CRRT) in critically ill patients with AKI by perfomring a cohort study over four critical care units within a single university-affiliated medical centre in Toronto, Canada. They examined 77 consecutive critically ill patients with AKI who completed at least two RRT sessions, out of which 34 patients were predominantly treated with IHD, 30 with CRRT and 13 with SLED. Hemodynamic instability was defined as the composite drop of > 20% in mean arterial pressure or any escalation in vasopressor requirements and feasibility was measured by noting any interrupted session defined as < 90% of the prescribed time was administered. In the 77 patients a total of 223 RRT sessions were analysed. They observed that hemodynamic instability occurred during 22 (56.4%) SLED and 43 (50.0%) CRRT sessions (p = 0.51). In a multivariable analysis the odds ratio for hemodynamic instability with SLED was 1.20 (95% CI 0.58-2.47), as compared to CRRT. Session interruption occurred in 16 (16.3%), 30 (34.9%) and 11 (28.2%) of IHD, CRRT and SLED therapies, respectively. They inferred that in critically ill patients with AKI, the administration of SLED is feasible and provides comparable hemodynamic control to CRRT

Marshall et al (2010)[108] retrospectively examined the mortality data from three general intensive care units (ICUs) in different countries that have switched their predominant therapeutic approach from CRRT to prolonged intermittent RRT. From 1 January 1995 to 31 December 2005, they analysed data from 1347 patients in four ICUs in New Zealand, Australia and Italy. They found that change from CRRT to PIRRT did not lead to any increase in mortality rate, with an adjusted IRR of 1.02 (0.61–1.71). The IRR was virtually identical in the three ICUs (P-value = 0.63 for the difference in the IRR between ICUs).

George et al. (2011)[28] performed an open prospective randomized study of patients with acute kidney injury (AKI) and multi-organ involvement admitted to the intensive care unit over a period of three years. They randomly allocated 50 patients to continuous venovenous

hemodiafiltration (CVVHDF, group A) or to continuous peritoneal dialysis (CPD, group B), with 25 patients in each group. The primary outcome designated for the study was the composite correction of uremia, acidosis, fluid overload, and hyperkalemia while improvement of sensorium and hemodynamic instability, survival, and overall cost were defined as secondary outcomes. Patients in Group A received 21.68 ± 13.46 hours of CVVHDF while those in Group B received 66.02 ± 69.77 hours of dialysis respectively (p = 0.01). Within 6 hr mortality was higher in group A mainly due to hemodynamic disturbances, but the difference was non- significant (p = 0.20). Hypotension occurred in 10 group A patients and in 1 group B patient during the procedure (p < 0.001), requiring transient or permanent discontinuation of dialysis in 8 group A patients (80%). Composite correction was achieved in 12 patients of group A (48%) and in 14 patients of group B (56%). A statistically significant difference was seen in urea and creatinine clearances which were higher in group A (21.72 ± 10.41 mL/min and 9.36 ± 4.93 mL/min respectively) vs Group B (22.13 ± 9.61 mL/min and 10.5 ± 6.07 mL/min) with *p-value* < 0.001). Acidosis was present in 21 patients of group A (84%) and in 16 of group B (64%); correction was better in group B (p < 0.001). Similarly correction of fluid overload was quicker and the volume of ultrafiltrate was significantly greater in group A (20.31 ± 21.86 L vs. 5.31 ± 5.75 L, p < 0.001). No significant differences were seen in correction of hyperkalemia, altered sensorium, or hemodynamic disturbance. Mortality was 84% in group A and 72% in group B. Factors that had clear influence on the final outcome were the APACHE (Acute Physiology and Chronic Health Evaluation) II score (p = 0.02) and requirement for ventilatory support (p < 0.01). Cost of disposables was higher in group A [INR 7184 ± 1436] than in group B [INR 3009 ± 1643] the difference being significant, p < 0.001 (US$1 = INR 47)].

Schwenger et al. (2012)[109] conducted a renal replacement therapy study in ICU patients (RESCUE) trial which was prospective, randomized, interventional, clinical study at a surgical intensive care

unit of a university hospital in Hiedelberg, Germany. They randomized 232AKI patients receiving RRT into two groups, Group 1 who received 12-h SLED-BD (n=115) and Group 2 received 24-h predilutional CVVH (n=117). Both therapies were performed at a blood flow of 100 to 120 ml/min. The 115 patients were treated with SLED-BD received a total of 817 treatments and 117 patients with CVVH received total of 877 treatments. The primary outcome measure, 90-day mortality, was similar between groups (SLED: 49.6% vs. CVVH: 55.6%, P = 0.43) and also the hemodynamic stability did not differ between SLED-BD and CVVH. In comparison to CVVH, patients in the SLED-BD group spent much fewer days of mechanical ventilation (17.7 ± 19.4 vs. 20.9 ± 19.8, P = 0.047) and fewer days in the ICU (19.6 ± 20.1 vs. 23.7 ± 21.9, P = 0.04). Similarly patients in SLED-BD group required fewer blood transfusions (1,375 ± 2,573 ml vs. 1,976 ± 3,316 ml, P = 0.02) and had a substantial reduction in nursing time spent for renal replacement therapy (P < 0.001) resulting in lower costs. In the light of this evidence they concluded that SLED-BD patients required less nursing time and incurred lower costs compared to CVVH at similar outcomes. Hence, SLED-BD offers an attractive alternative for the treatment of AKI in ICU patients.

Zhang et al. (2012)[110] performed a 1:2 matched case-control study to evaluate clinical outcomes of patients transferred to peritoneal dialysis (PD) secondary to complications of hemodialysis (HD). They compared patient and technique survival between patients initially treated with HD for at least 3 months and then transferred to PD (transfer group) and patients started on and continuing with PD (no-transfer group). Compared to the transfer group, patients in the no-transfer group had a higher initial daily residual urinary output [850 mL (range: 600 - 1250 mL) vs 0 mL (range: 0 - 775 mL/d), p = 0.000]. The most important reasons for transfer to PD in the study were problems with vascular access and cardiovascular disease. Patient survival and technique failure rates did not significantly differ between the groups (p > 0.05). The 1-, 3-, and 5-year patient survival rates were 80.0%,

53.7%, and 27.6% in the transfer group and 89.7%, 60.2%, and 43.1% in the no-transfer group. Patient's age and low serum albumin were independent risk factors for long-term mortality in patients on PD. Relative risk of either death or technique failure was not significantly increased in patients transferred from HD. This study suggested that no difference in outcome existed between patients who transferred to PD after failing HD to those who started with and were maintained on PD.

Schefold et al. (2014)[111] In a single-center prospective randomized controlled trial ("CONVINT") included 252 critically ill patients (159 male; mean age, 61.5 ± 13.9 years; Acute Physiology and Chronic Health Evaluation (APACHE) II score, 28.6 ± 8.8) investigated the effect of two major RRT strategies (intermittent hemodialysis (IHD) and continuous veno-venous hemofiltration (CVVHF)) on mortality and renal-related outcome measures. The primary outcome measure used was 14 –day survival after the cessation of RRT. Additionally secondary outcome measures were employed e.g 30-day mortality, intensive care unit mortality, and in-hospital mortality. They also studied the course of disease severity/biomarkers and need for organ-support therapy in these patients. The two groups were comparable in allascpects at the start of the trial. Survival rates at 14 days after RRT were 39.5% (IHD) versus 43.9% (CVVH) (odds ratio (OR), 0.84; 95% confidence interval (CI), 0.49 to 1.41; P = 0.50). There was no significatnt difference on any of the parameteres 14-day-, 30-day, and all-cause intrahospital mortality rates (all P > 0.5). Similarly no differences were observed in days on RRT, days on vasopressor therapy, days on ventilator, or length of ICU or hospital stay. The authors concluded that intermittent and continuous RRTs may be considered equivalent approaches for critically ill patients with dialysis-dependent acute renal failure.

Zhiping Sun et al. (2014)[112] carried out a retrospective analysis of 145 septic AKI patients who underwent renal replacement therapy (RRT) over a period of 4 years between 2009 and 2014. They

compared the effects of Continuous venovenous hemofiltration (CVVHF) [greater than 72 hours] with extended daily hemofiltration (EDHF) (8 to 12 hours daily), using the same polyacrylonitrile membrane and bicarbonate-based buffer, on renal recovery and 60-mortality in patients with severe sepsis or septic shock and concurrent acute kidney injury (AKI). Sixty-five (65) patients were treated with CVVHF while eighty (80) patients were managed with EDHF. Higher recovery of renal function (50.77%) was observed in patients in the CVVHF group in comparison to EDHF group (32.50%)[P = 0.02]. Similarly CVHF patients fared better in terms of speed of recovery, median time 17.26 days in CVVHF vs 25.46 days for EDHF (P = 0.039). No significant difference was seen in terms of sixty-day mortality between CVVHF and EDHF groups (44.62%, and 46.25%, respectively; P = 0.844). More than half (55.38%) of patients on CVVHF and nearly one-third (28.75%) patients on EDHF developed hypophosphatemia (P = 0.001) suggesting that CVVHF carries a higher risk of hypophosphatemia. No such difference was observed between the two modalities for other adverse effects. On multivariate analysis, including physiologically clinical relevant variables, CVVHF therapy was significantly associated with recovery of renal function (HR 3.74; 95% CI 1.82 to 7.68; P < 0.001), but not with mortality (HR 0.69; 95% CI 0.34 to 1.41; P = 0.312). The authors concluded that CVVHF significantly improved the renal recovery independent of clinically relevant variables while as the 60-day mortality in patients with septic AKI was similar in both cases.

Zhang et al (2015)[113] conducted a systematic review and meta-analysis of RCTs and observational studies by searching in MEDLINE, EMBASE, the Cochrane Library, Google Scholar, and a Chinese database (SinsoMed) to compare the outcome of Extended Daily Dialysis with Continuous Renal Replacement. They included 17 studies from 2000 to 2014 which comprised 7 RCTs and 10 observational studies involving a total of 1308 patients (RCTs 533 and observational studies 675). Meta-analysis of RCTs showed no difference in mortality

rates between EDD and CRRT (relative risk, 0.90; 95% CI, 0.74-1.11; P 5 0.3). However, EDD was associated with lower mortality risk compared with CRRT in observational studies (relative risk, 0.86; 95% CI, 0.74-1.00; P 5 0.05). This effect could be because of some selection or allocation bias seen in observational studies. There was no evidence of heterogeneity in RCTs (I2 5 0%) or observational studies (I2 5 15%). In both RCTs and observational studies, there were no significant differences in rates of renal recovery, fluid removal, or duration of stay in ICU, and EDD showed similar efficacy to CRRT during in correcting metabolic derangements in levels of serum urea, serum creatinine, and serum phosphate. They concluded that EDD is associated with similar outcomes to CRRT in RCTs.

Kitchlu et al. (2015) [29] conducted a cohort study of patients with AKI admitted in 4 different ICUs in Toronto, Canada. They compared the outcomes in 158 patients treated with SLED (target 8 h/session, blood flow 200 mL/min, predominantly without anticoagulation) with 74 treated with CRRT in four ICUs at an academic medical centre. The primary outcome defined for the study was 30-day mortality after commencing RRT after being adjusted for confounding factors like demographic parameters, comorbidity, baseline kidney function, and Sequential Organ Failure Assessment score. Persistent need for RRT at 30 days and early clinical deterioration, defined as a rise in SOFA score or death at 48 h after starting RRT were designated as secondary outcomes. The mortality at 30 days was 54 % and 61 % among SLED- and CRRT-treated patients, respectively [adjusted odds ratio (OR) 1.07, 95 % CI 0.56–2.03, as compared with CRRT]. No significant difference was seen between the two groups in terms of risk of RRT dependence at 30 days (adjusted OR 1.36, 95 % CI 0.51–3.57 SLED) and early clinical deterioration (adjusted OR 0.73, 95 % CI 0.40–1.34 SLED). Hence their study found similar clinical outcomes for patients treated with SLED and CRRT. They concluded SLED was an acceptable alternative form of renal support in hemodynamically unstable patients with AKI.

Truche et al. (2016)[114] in an observational study compared Continuous renal replacement therapy (CRRT0 with intermittent hemodialysis (IHD) in intensive care patients. They compared mortality at day 30 and short- and long-term renal recovery between patients treated with continuous RRT verus those treated with intermittent hemodialysis. The study included patients from the prospective observational multicenter cohort database OUTCOMEREA™ who had underwent at least one RRT session between 2004 and 2014. Using a marginal structural Cox model, bias was reduced by minimizing or eliminating the confounding factors like patient's baseline and daily characteristics. They used 30-day mortality and dialysis dependency as the composite endpoints for the study. Among 1360 patients that were included in the study with RRT, 544 (40.0 %) and 816 (60.0 %) were initially treated by continuous RRT and intermittent hemodialysis, respectively. The 30-day mortality was 39.6 %. Among survivors, 23.8 % were in need of RRT. There was no difference between groups for the primary endpoint in global population (HR 1.00, 95 % CI 0.77-1.29; p = 0.97). In patients with higher weight gain at RRT initiation, mortality and dialysis dependency were significantly lower with continuous RRT (HR 0.54, 95 % CI 0.29-0.99; p = 0.05). In contrast RRT appeared to be deleterious in patients without shock (HR 2.24, 95 % CI 1.24-4.04; p = 0.01). Six-month mortality and persistent renal dysfunction were not influenced by the RRT modality in patients with dialysis dependence at ICU discharge. They concluded that there was no improvement in 30-day and 6-month patient outcomes in patients on RRT. Some benefit was seen in patients with fluid overload, in the absence of hemodynamic failure RRT may be harmful.

Liang (2017)[115] performed a retrospective cohort study of 4738 adult (>18)patients with Kidney Disease Improving Global Outcomes stage 3 AKI who were admitted in intensive care units and received RRT (from 2000 to 2008) and were alive at hospital discharge or 90 days. The endpoints defined were survival and renal recovery (no need of further RRT) and reasons for nonrecovery (death or ESRD) at 90 and 365

days were also studied. Out of the 4738 patients, 1338 (28.2%) had received RRT, and 638 (47.7%) survived to hospital discharge (353 intermittent hemodialysis and 285 continuous RRT).

Recovery from AKI was lower for intermittent hemodialysis (IHD) versus continuous RRT (CRRT) at 90 days (66.6% for IHD versus 75.4% for CRRT; P=0.02) but similar at 365 days (54.1% IHD vs 59.6% for CRRT; P=0.17). Mulativariate analysis also demonstrated that there was no difference in odds of recovery at 90 or 365 days for patients initially treated with continuous RRT versus intermittent hemodialysis (90 days: odds ratio, 1.19; 95% confidence interval, 0.91 to 1.55; P=0.20; 365 days: odds ratio, 0.93; 95% confidence interval, 0.72 to 1.2; P=0.55). They concluded that when initial RRT modality is chosen primarily on hemodynamics, renal recovery and clinical outcomes in survivors are similar between intermittent hemodialysis and continuous RRT.

Nash et al. (2017) [35] conducted a systematic review and meta-analysis of studies published before 2016 using MEDLINE®, EMBASE®, Cochrane databases and grey literature. They analysed the data from 21 studies, a total of 5015 participants (CRRT vs IHD: 16 studies, 4539 participants; CRRT vs SLED: five studies, 476 participants) and compared the clinical outcomes among critically ill adults with acute kidney injury (AKI) treated with continuous renal replacement therapy (CRRT), intermittent hemodialysis (IHD) or sustained low efficiency dialysis (SLED). The outcomes measured were mortality, dialysis dependence or length of stay. Mortality and dialysis dependence from RCTs were pooled using meta-analytic techniques while length of stay from RCTs and results from prospective cohort studies were described qualitatively. They observed no modality was associated with in-hospital mortality (CRRT vs IHD: RR 1.00 [95% CI, 0.92–1.09], CRRT vs SLED: RR 1.23 [95% CI, 1.00–1.51]) or dialysis dependence (CRRT vs IHD: RR 0.90 [95% CI, 0.59–1.38], CRRT vs SLED: RR 1.15 [95% CI, 0.67–1.99]) They concluded that

there was no definitive advantage for any RRT modality on short-term patient or kidney survival.

Kovacs (2017) [31] performed a systematic search of Medline, Embase, CINAHL, and the Cochrane Library in February 2015, and included 18 studies with a total of 1564 adult hemodynamically unstable patients with AKI in their meta-analysis. Out of 1564 patients 738 were treated with CRRT and 826 were treated with some form of SLED. The primary outcome of the review was renal recovery and time to recovery and mortality were designated as a secondary outcome. The reults showed indicated no statistically significant difference in either overall renal recovery (risk ratio (RR) 0.87, 95% confidence interval (CI) 0.63-1.20, I2 66%) or time to renal recovery (mean difference 1.33, 95% CI 0.23-2.88, I2 0%). SLED was slightly better than CRRT in terms of mortality (RR 1.21, 95% CI 1.02-1.43, I2 47%), however this effect decreased when a sensitivity analysis of only RCTs was conducted (RR 1.25, 95% CI 1.00-1.57, I2=0%). The authors concluded that there is no clear evidence of advantage of continuous renal replacement in the hemodynamically unstable patient. Both modalities, CRRT and SLED, are safe and effective means of treating AKI in the critically ill adult.

Jaryal et al. (2017) [27] conducted retrospective analysis of all the patients who received CRRT and acute PD at a tertiary care institute in Northern India over a period of one year. The outcome measured was survival at discharge. Forty patients, 22 in CRRT and 18 in acute PD group were studied. All these patients required inotropes to maintain desired blood pressure. All the patients in CRRT group were treated with continuous venovenous hemodiafiltration (CVVHDF) on Fresenius multifiltrate machine. Unfractionated heparin was used as an anticoagulant. Both dialysate and substitute were used as prepackaged products. The blood flow rate was kept at 150 ml/min, and effluent volume was targeted at about 25 ml/kg/h. All the PD were done using stiff PD catheters bedside by person trained in nephrology. A total of 40–60 exchanges were planned with prepackaged 1.5% dextrose PD fluid, with dwell time of 30 mintes over a 48–72 h period, and

subsequently, PD catheters were removed. Twenty-five (62.5%) patients had acute kidney injury (AKI), and 15 (37.5%) had chronic kidney disease (CKD) superimposed over other primary diagnosis. A total of 8 (20%) patients (4 in CRRT, 4 in acute PD) survived at the time of discharge from hospital making the mortality rate 80%. The mean age of survivors was approximately 10 years less than that of nonsurvivors (*P* = 0.15). Overall, there were no survivors in CKD group and all the patients who survived at the time of discharge from hospital had underlying AKI (*P* = 0.016).

Datt et al. (2017) [33] performed a prospective study of critically ill adult (>18) patients with AKI requiring dialysis from July 2013 to December 2014. The authors excluded patients who died within 12 h of initiating RRT, patients with preexisting chronic kidney disease and/or end-stage renal disease, pregnant patients and patients with obstructive uropathy. APACHE II and Sequential organ failure assessment (SOFA)scores were calculated daily and Kt/V urea was calculated for each session of RRT. The primary outcome of the study was 28- and 90-day survival of patient and renal function. Secondary outcomes were an improvement in metabolic and clinical parameters (acidosis, hyperkalemia, encephalopathy, and fluid overload) and duration of hospital stay. Any complications that occurred during the treatment were noted. The study included thirty-three patients out of which 17 underwent IPD and 16 were treated with SLED. Both groups had comparable baseline characteristics and demographic parameters. Among 54 sessions of IPD the average dialysate volume was 16.65 L/session and mean ultrafiltration achieved was 2.4 L/session. A total of 50 sessions of SLED were also carried out. The weekly mean Kt/V attained in the SLED was higher than the IPD group was (4.7 vs 2.02, respectively, *P* < 0.001). Ultrafiltration achieved with IPD was significantly higher during first two sessions (2.35 L and 2.7 L) as compared to the ultrafiltration achieved with SLED (1.2 L and 1.3 L) (*P* = 0.03 and *P* = 0.018). At the end of the study, patient survival at day 28 and 90 was 11.6% and 6.2% in IPD group in contrast the same numbers for the

SLED group were 5.8% and 6.2%. Hyperkalemia was resolved in 100% of patients in IPD group after the first session. The authors concluded that in the management of AKI in critically ill patients, IPD is comparable to SLED in terms of correction of metabolic and clinical derangements.

Wang et al. (2018) [21] published a review to summarize the recently published data regarding comparisons of these three RRT modalities on clinical outcomes i.e intermittent hemodialysis (IHD), sustained low-efficiency dialysis (SLED) or continuous renal replacement therapy (CRRT) like, mortality and recovery of renal function among severe AKI patients. The authors suggest that though there is good evidence and acceptance that CRRT should be used in hemodynamically unstable AKI patients, its survival advantages over IHD remains unproven because of paucity of evidence from well powered randomized controlled trials (RCTs). Moreover, they suggest that CRRT does not offer superior results to intermittent renal replacement therapy (IRRT) in hemodynamically stable patients. Although on initial analysis patients receiving sustained lowefficiency dialysis (SLED) appear to suffer lower mortality than CRRT, it is possibe that these higher survival rates may be secondary to selection bias in observational studies which form the major evidence base for SLED. The literature they probed lacks any solid evidence to support any of the three modes of RRT in patients with severe AKI in terms of patient survival however observational data suggests IHD treatment of AKI may delay renal recovery.

Allegreti et al. (2020) [116] examined the utility of accelerated venovenous hemofiltration (AVVH) as a transition therapy between CRRT and IHD0000. AVVH uses higher hemofiltration rates (4–5 L/h) with shorter sessions (8–10 h) to “accelerate” the solute clearance and volume removal. They conducted a retrospective cohort study evaluating the clinical outcomes of the using AVVH as a therapeutic bridge between CRRT and IHD by evaluating mortality, length of ICU stay and readmission rates. In total, 97 patients received a total of 298

AVVH treatments (3.1 ± 3.3 treatments per patient) of which only 9% were prematurely terminated. The average treatment time was 9.5 ± 1.6 h with 4.2 ± 0.5 L/h replacement fluid rate, and the urea reduction ratio observed was 23 ± 26% per 10-h treatment, and net ultrafiltration volume was 2.4 ± 1.3 L/treatment. In-hospital mortality was 32%, and the patients spent mean 54 ± 47 days in the hospital. Sixty-four out of 97 (66%) patients recovered renal function by discharge. Seven out of 162 required readmission after being discharged from the ICU as they developed hypotension on IHD. The authors posed that AVVH can serve as a transition therapy between CRRT and IHD in the ICU and has the potential to decrease total time on CRRT, improve patient mobility, and sustain low ICU readmission rates.

Jonny et al. (2020) [117] assessed the incidence of AKI and various modalities of renal replacement therapy (RRT) in ICUs in Indonesia. A total of 952 patients were studied and divided into non- AKI and AKI groups who were further categorized into three groups based on 3 different stages of AKI as per the Kidney Disease Improving Global Outcome (KDIGO) criteria. The overall incidence of AKI was 43% of which 18.5% had stage 1, 33% had stage 2, and 48.5% had stage 3. Primary diagnosis of renal disease and high APACHE II score were the risk factors associated with AKI (OR = 4.53, 95% CI: 1.67–12.33, p = 0.003 and OR = 1.14 per 1 unit increase, 95% CI: 1.09–1.20, p < 0.001, respectively). Chronic kidney disease was the risk factor for severe AKI. Sepsis was the leading cause of AKI. Among the AKI participants, 24.6% required RRT. The most common RRT modalities were intermittent hemodialysis (71.7%), followed by slow low-efficiency dialysis (22.8%), continuous renal replacement therapy (4.3%), and peritoneal dialysis (1.1%). Conclusions: This study showed that AKI was a common problem in the Indonesian ICU. We strongly believe that identification of the risk factors associated with AKI will help us develop a predictive score for AKI so we can prevent and improve AKI outcome in the future.

Zhao and Chen (2020) [118] published a systematic review and meta-analysis of articles published in the databases (PubMed, Web of Science, EMBASE, Medline, and Google Scholar) until June 2019 and calculated the relative risks with 95% confidence intervals for binary outcomes i.e renal function recovery and mortality. The analysis showed no significant differences in recovery of renal function, in-hospital mortality, and in-ICU mortality between AKI patients given CRRT and those given sustained low-efficiency dialysis (SLED). Similarly no significant difference was found between CRRT group and IHD group in terms of in-hospital mortality, though in-ICU mortality was higher in AKI patients given CRRT, compared to those given IHD. The three modalities (CRRT, IHD, and SLED) have their own advantages and disadvantages and preferring any one over the other is not backed by strong evidence.

In **June 2020 R Sharma and M Maksana** [119] published their results of a single centre, prospective study performed in a medical ICU on 228 patients with AKI and evaluated the safety, efficacy and functional outcome of SLED. These patients had multiple comorbidities like hypertension in 56%, diabetes mellitus in 43%, CKD in 33% and cardiovascular diseases in 28%. The most common precipitants for AKI were sepsis (93%) and hypoperfusion (68%). Refractory fluid overload (91%) and refractory metabolic acidosis (79%) formed the most common indications for SLED. The patients were fairly sick with mean SOFA score of 12.2 ± 7.75 with >11 SOFA score seen in 61 % patients. Nearly two-third of the patients (66%) were on mechanical ventilator.

Treatment session was completed in 555 sessions (96%) without any adverse event and the goal set for ultrafiltration was accomplished in 94%. SLED was able to correct metabolic acidosis in majority (86.1%) of the cases. Over two-third (68%) SLED sessions required a vasopressor support and 34.8 % of SLED sessions were associated with hemodynamic instability. Total 14 (6.2 %) patients died during SLED session. No case of cardiac arrhythmia was seen. Sixty one per

cent patients died during the hospital stay while another 13% died at 6 months follow up. In subgroup analysis, mortality was significantly higher in patients with SOFA score more than 11 (P<0.0001). Ventilatory requirement was also significantly associated with mortality (P<0.0001). This study demonstrated the efficacy and safety of SLED in critically ill AKI patients in medical ICU which achieved the planned goals of ultrafiltration goal and correction metabolic acidosis in majority of patients with good hemodynamic tolerability. Mortality was noted in 61% of patients (not attributable to SLED per se). High initial SOFA score, underlying co-morbidities, requirement of vasopressor support and severe acidosis (pH <7.25) were associated with high mortality. The authors concluded that SLED is a reasonable cost-effective option of RRT in hemodynamically unstable patients with AKI especially in developing countries.

MATERIAL & METHODS

Patients with AKI with hemodynamic instability requiring RRT, treated in the department of Nephrology and Intensive Care units, at the Dayanand Medical College and Hospital, Ludhiana, were included in this study, from April 2018 until March 2020. Data of all these patients who received continuous renal replacement (CRRT), Sustained low efficiency dialysis (SLED) and acute peritoneal dialysis (PD) at this centre was collected.

SOURCE OF DATA

All the data was collected from hemodynamically unstable patients requiring RRT admitted to Dayanand Medical College and Hospital, Ludhiana.

A full, free, informed consent was taken from all the patients.

METHOD OF COLLECTION OF DATA

Inclusion Criteria: During the recruitment, adult (>18 years) patients with acute kidney injury (AKI) with any etiology with hemodynamic instability requiring renal replacement (RRT) were eligible for inclusion in the study. AKI was diagnosed by KDIGO diagnostic criteria, on the basis of rise in serum creatinine by >0.3 mg/dl within 48 h period or urine output <0.5 ml/kg/h for 6 hour.

Exclusion criteria: (a) preexisting chronic kidney disease receiving chronic dialysis; (b) kidney-transplant recipients; (c) denial of written informed consent (patient, legal representative, or legal proxy).

Need for RRT was defined as presence of at least one of the following criteria (and was decided by treating consultant): (a) clinical symptoms of uremia (that is, gastrointestinal symptoms: (for example, nausea, vomiting, diarrhea not explained otherwise; or neurologic symptoms: mental confusion, severe weakness, seizures/coma not explained otherwise; or evidence of pericardial effusion); (b) persisting oliguria (urinary excretion rate <0.5 ml/kg/min for >12 hours), or anuria (anuria for >12 hours or <0.3 ml/kg/h for >24 hours), despite adequate fluid management; (c) fluid overload not responding to diuretic treatment; (d) blood urea nitrogen (BUN) levels >100 mg/dl or creatinine clearance

<0.1 ml/ kg of body weight/min; (e) severe metabolic acidosis (pH <7.2) not responding to conventional treatment; and (f) hyperkalemia not responding to conservative treatment. Sepsis was diagnosed on the basis of fulfillment of systemic inflammatory response syndrome criteria with confirmed or presumed infection.

All the patients received CRRT on Baxter Prismaflex system multifiltrate machine. Dialysate and substitute is prepackaged. The blood flow rate was kept at 100-150 ml/min, and effluent volume was targeted at about 30ml/kg/h. All the PD procedures were done bedside by trained person. Stiff PD catheter was inserted under aseptic precautions percutaneously. A total of 40–60 exchanges were done with prepackaged 1.5% dextrose PD fluid, with dwell time of ½ h over 48–72 h period, and subsequently, PD catheters were removed. SLED therapy used conventional hemodialysis machines with lower blood-pump speeds and dialysate flow rates to provide solute and fluid removal slower than IHD but faster than conventional CRRT. Typically, low blood-pump speeds of 200 mL/min and low dialysate flow rates of 300 mL/min for 6 to 12 hours daily were used. Patients in all three study groups were allowed to be switched to the other modality in cases of significant medical reasons that is either in cases of severe RRT modality associated complications or whenever the other modality was not withheld for significanct medical reasons. Typical reasons for switching of RRT modality were: continuous severe hypotension with requirement of advanced inotropic support or impossibility of maintaining fluid homeostasis, patient immobilization, impossibility of maintaining electrolyte/ acid base homeostasis, impossibility of delivering an adequate dialysis dose, impossibility of performing CVVH without anticoagulation in patients with bleeding complications/repeated filter clotting. Number of changes in RRT modality and respected reasons were recorded.

The data was analysed for diagnosis, type of RRT, and survival outcome in patients at the time of discharge from hospital. The primary outcome measure of the study was survival at 14 days after end of RRT. Secondary outcome measures included 14-day-, 30-day-, all

cause intrahospital mortality, days until death (on ICU), days in ICU/hospital, cumulative fluid removal over 7 days, days on RRT/dialysis-free days, total days on vasopressors/mechanical ventilation, ICU type, correction of acidosis, hyperkalemia and course of disease severity (that is, clinical scores).

Baseline demographics (including hospital/ICU admission day), baseline laboratory data (including baseline blood-gas analyses, urinary output), concomitant diagnoses, and reasons for AKI were recorded. For assessment of clinical disease severity over time, Sepsis-related Organ Failure Assessment (SOFA score) Acute Physiology was recorded at baseline. Hemodynamic status and the rate of inotrope infusion of the patients were noted. Hemodynamic status at admission, at start of the RRT mortality, day 1 (24 hours) day 2 (48 hours) and day 3 (72 hours)/stoppage of dialysis was monitored. Any procedure related complications and duration of the ICU stay were noted. Final outcome of the patient depended upon the successful correction of uremia with blood urea levels <40mg/dL or less than the initial value correction of acidosis having pH ≥ 7.25 or when serum bicarbonate ≥ 15 mEq/L and along with correction of hyperkalemia to the level of ≤ 5.5 mEq/L, along with the clinical clearance of pitting edema, fine basal crackles, improvement of sensorium and hemodynamic stability. Data on respective RRT treatments, changes in RRT modality, necessity for mechanical ventilation or vasopressor support, routine laboratory data (daily until study day 10 and at days 15, 21), and outcome-related data were recorded. Patients were followed until 14 days after RRT, withdrawal of consent, or death. Follow-up was performed by using electronic hospital data-management systems or telephone follow-up.

STATISTICAL ANALYSIS

Data was described in terms of range; mean ±standard deviation (± SD), median, frequencies (number of cases) and relative frequencies (percentages) as appropriate. Comparison of quantitative variables between the study groups was done using ANOVA. For comparing categorical data, Chi square ($\chi 2$) test was performed and exact test

was used when the expected frequency was less than 5. A probability value (p value) less than 0.05 was considered statistically significant. All statistical calculations were done using SPSS (Statistical Package for the Social Science) SPSS 21 version statistical program for Microsoft Windows.

OBSERVATION & RESULTS

We screeened 425 admitted patients in different ICUs for eligilibility. Applying the inclusion criteria of our study, we excluded 176 patients leaving us with a sample of 249 patients. Out of the total sample size, 100 patients were initiated with CRRT, 111 on SLED and 38 on PD. There was missing data in 1 patients in CRRT group and in 3 patients in SLED group, which left us with a total of 245 patients with full data that was analyzed for the study.

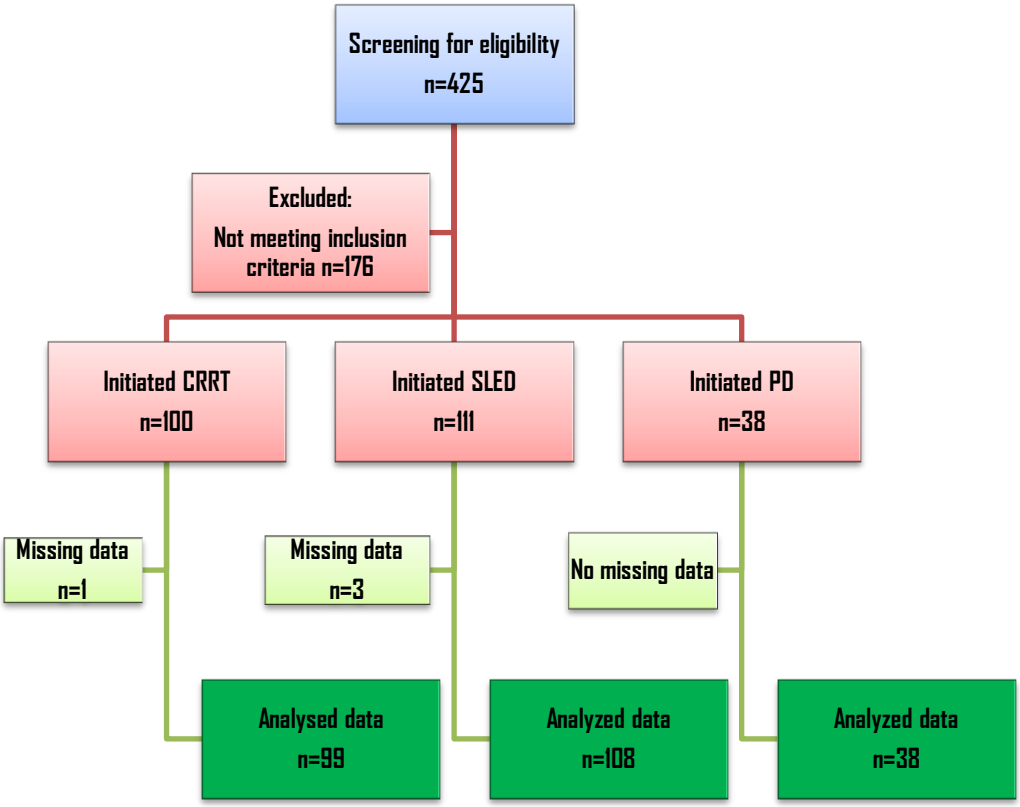


Figure 1: Flow diagram of the study

Baseline demographics and clinical characteristics of patients

Age

The mean age of the patients in each of our study group was as follows: CRRT 61.91 years, SLED 61.15 years and PD 62.74 years. The very miniscule difference in the mean ages in the three groups was statistically insignificant. The overall mean age in our study population was 61.42 years.

Table 2: Mean Age (years)

	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
Age	61.91	9.82	61.55	9.25	62.74	9.64	0.220	0.803	0.785	0.650	0.509

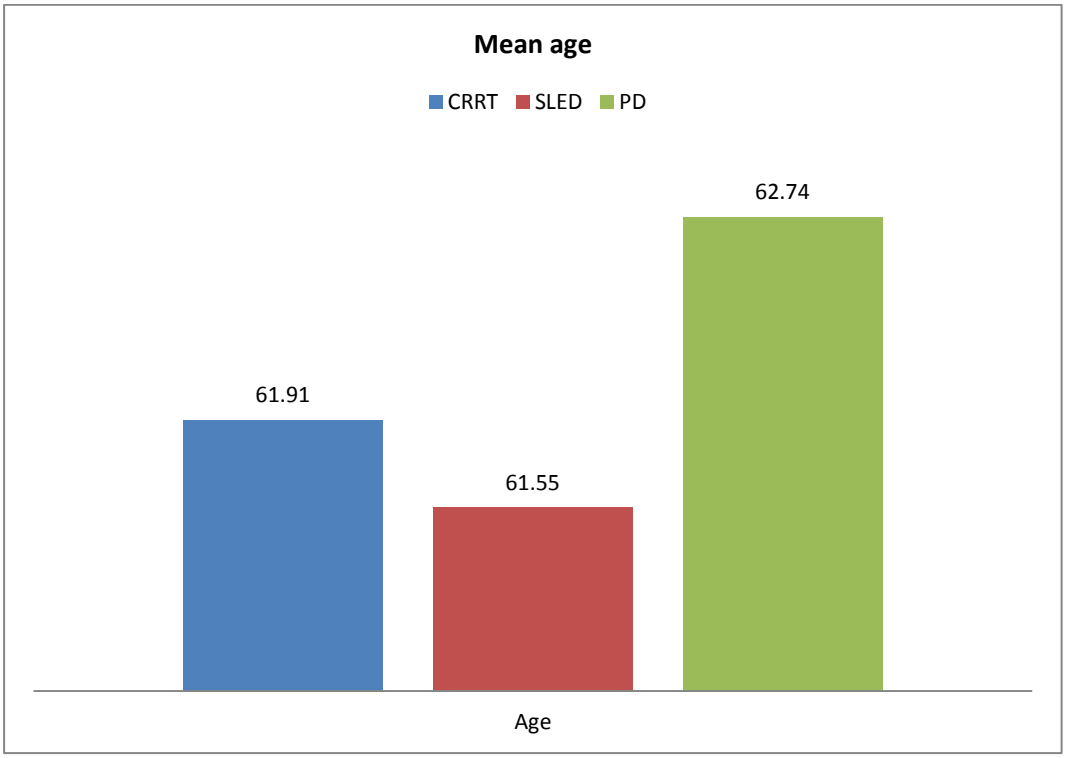


Figure 2: Mean Age (years)

Gender distribution

In all three study groups, males were slightly more common than females, though the difference had no statistical significance. In the CRRT group of 99 patients 54 were males while 45 were females. Similarly in the SLED group out of 108 patients 62 were males and 46 females and in PD group of 38 patients we had 23 males and 15 females. Overall among the total study population of 245 patients 139 were males while the rest (106 patients) were females.

Table 3: Gender Distribution

		Group						Total	chi-square value	p-value
		CRRT (n=99)		SLED (n=108)		PD(n=38)				
Gender	Male	54	54.5%	62	57.4%	23	60.5%	139	0.436	0.8
	Female	45	45.5%	46	42.6%	15	39.5%	106		

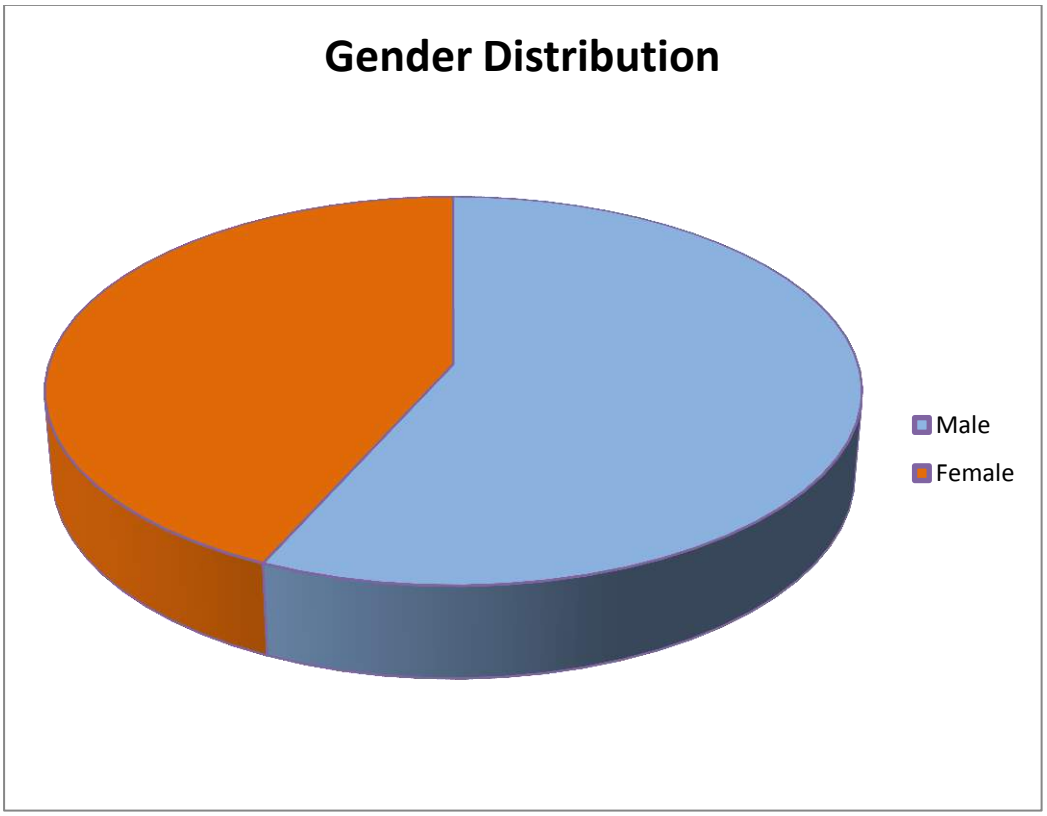


Figure 3: Over all gender distribution

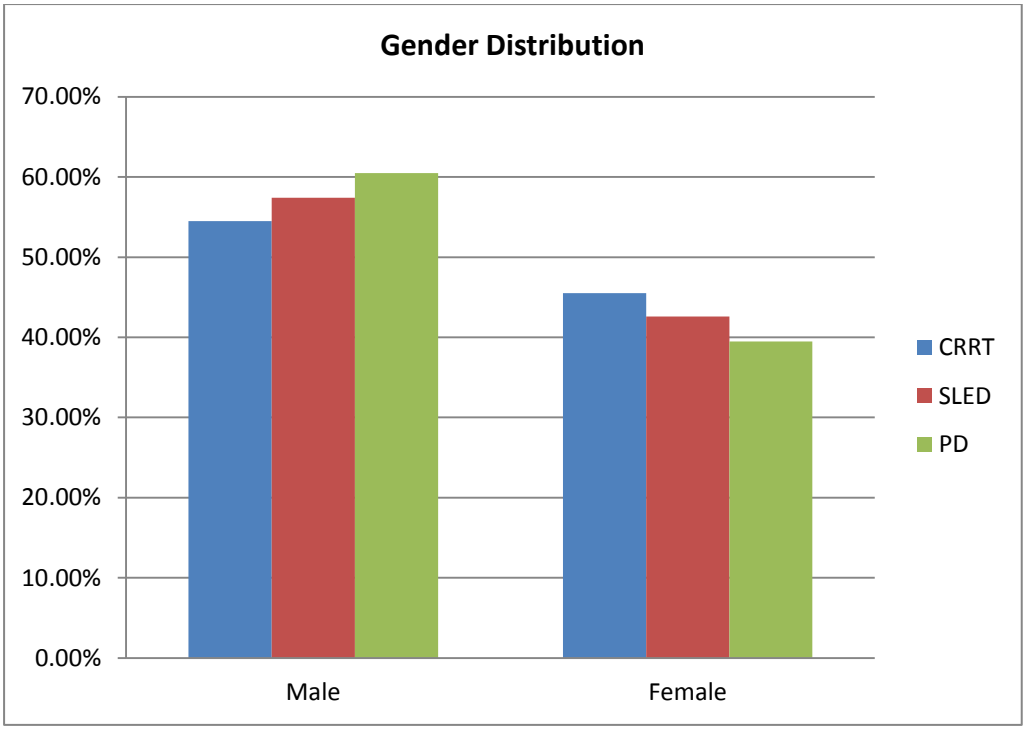


Figure 4: Group wise gender distribution

On the day of admission various clinical, haematological and biochemical parameters were taken and noted down. The following tables depict those parameters in the tabulated form while making comparisons between the three groups.

Hemoglobin

The mean Hb level in CRRT, SLED and PD groups was 9.72 g/dl, 9.76 g/dl and 9.61 g/dl respectively. None of these values was significantly different from the overall mean Hb level of 9.69 g/dl

Table 4: Mean Baseline Haemoglobin

	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
Hb (g/dl)	9.72	1.41	9.76	1.43	9.61	1.28	0.157	0.855	0.845	0.681	0.575

Blood pressure

All these patients required inotropes to maintain desired blood pressure. The blood pressure measurements taken on the day of admission are given below in table 5. The systolic blood pressure in the three groups was: CRRT 90.22 mmHg, SLED 90.37 mmHg and PD 90.63 mmHg while the diastolic blood pressure was 61.97 mmHg, 62.02 mmHg and 61.76 mmHg, respectively. The slight differences measured were of no significance. The mean arterial pressure (MAP) among the three groups was 71.39 mmHg, 71.47 mmHg and 71.38 mmHg in CRRT, SLED and PD groups respectively.

The overall mean SBP was 90.35 mmHg while the mean DBP was 61.96 mmHg. The dose of vasopressors needed to maintain desired blood pressure is discussed in table no 46.

Table 5: Mean Blood Pressure measurement

	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
SBP	90.22	4.89	90.37	4.92	90.63	4.49	0.100	0.905	0.826	0.658	0.775
DBP	61.97	5.47	62.02	5.28	61.76	3.48	0.035	0.965	0.945	0.833	0.792
MAP	71.39	4.64	71.47	4.48	71.38	3.14	0.011	0.989	0.893	0.999	0.920s

Premorbid creatinine

The premorbid levels of serum creatinine were observed from previous kidney function tests available with the patients. The overall mean level of premorbid creatinine was 2.55 in the entire study population. The mean premorbid serum creatinine levels in all three groups were 2.95, 2.22, 2.45 mg/dl in CRRT, SLED and PD groups, respectively. While the values obtained in the CRRT and PD groups were comparable to each other, the premorbid creatinine concentration differed significantly between the CRRT and SLED group (2.95 vs 2.22) with p-value of 0.001.

Table 6: Premorbid serum creatinine levels (mg/dL)

	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
Premorbid creatinine	2.95	0.80	2.22	0.61	2.45	0.72	6.546	0.003	0.001	0.041	0.337

Serum bicarbonate

The baseline serum levels of bicarbonate were noted and found to be comparable among all the three groups. The mean values for serum HCO_3 were 12.94, 12.84 and 12.50 in CRRT, SLED and PD groups, respectively. The overall mean was 12.83.3

Table 7: Baseline Bicarbonate level

	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
Hco3	12.94	2.85	12.84	2.88	12.50	2.86	0.325	0.723	0.808	0.423	0.527

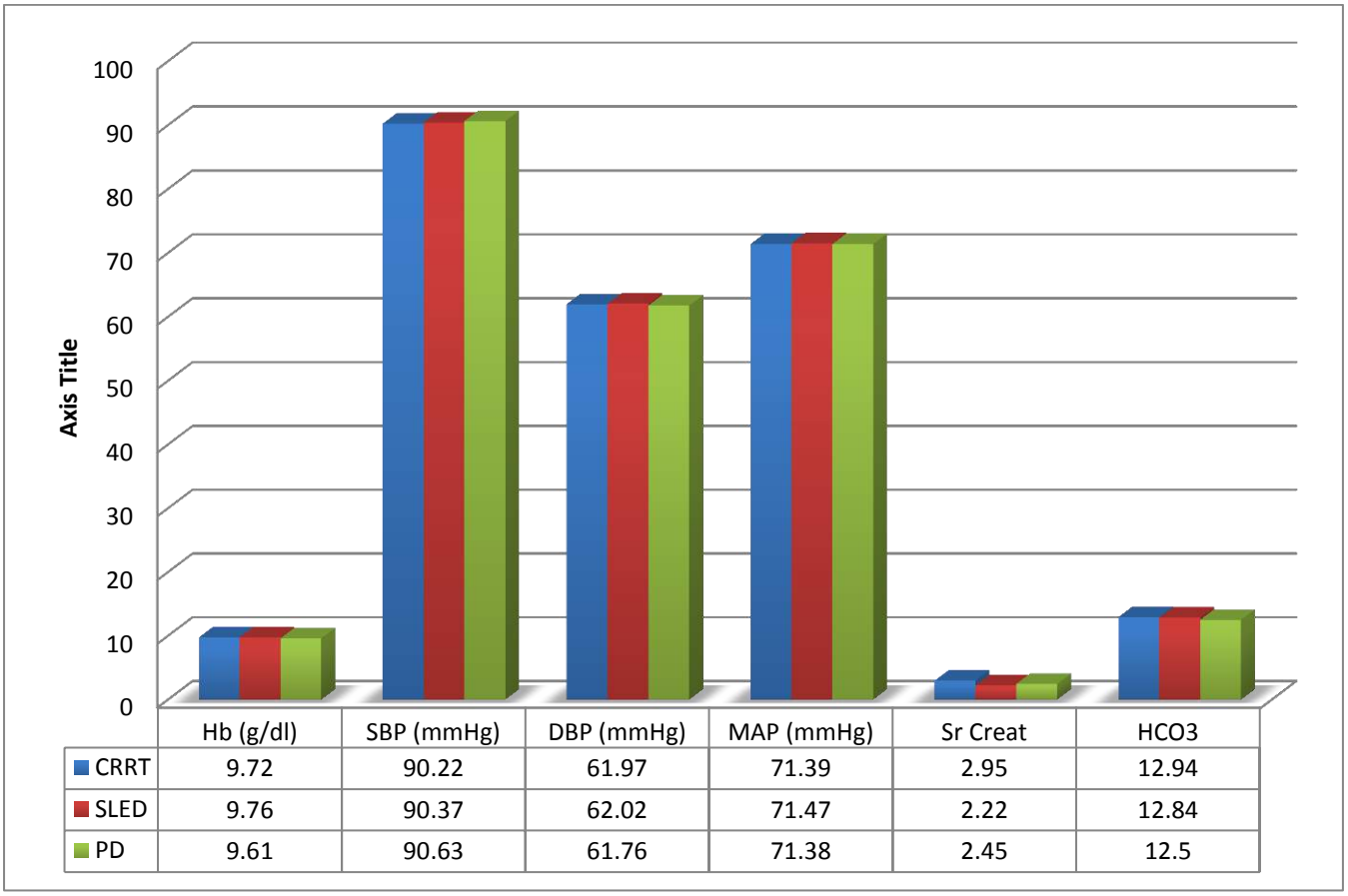


Figure 5: Baseline parameters

Admission day kidney function parameters

The various markers of kidney function were assayed/measured on the day of admission, including serum urea and creatinine levels, pH, and 24 hour urine output. Though all patients showed raised serum creatinine level (overall mean 8.90), serum urea level (overall mean 193.18), but the comparison of these parameters among the three groups was of no statistical significance. These parameters and their comparison between groups is shown in tables 6-8.

Table 8: Admission day Urea and Creatinine

	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
S. Creat. day 1	8.80	1.68	9.08	1.63	8.67	1.57	1.211	0.300	0.226	0.660	0.181
S. Urea day 1	198.03	39.97	187.90	37.07	195.68	45.23	1.780	0.171	0.067	0.756	0.30

All patients had a reduced urine output (overall mean 550.12) on day of admission and but the comparison of these parameters among the three groups was of no statistical significance.

Table 9: Admission day Urine output (ml/24 hrs)

	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
UOP day 1 (24hrs)	523.69	257.06	574.86	217.55	548.68	214.19	1.237	0.292	0.117	0.576	0.553

All the patients in our study population had metabolic acidosis on day of admission, with overall mean pH of 7.14, but there was no significant difference between the three groups.

Table 10: Admission day pH

	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
pH day 1	7.14	0.06	7.15	0.05	7.16	0.06	2.050	0.131	0.128	0.072	0.482

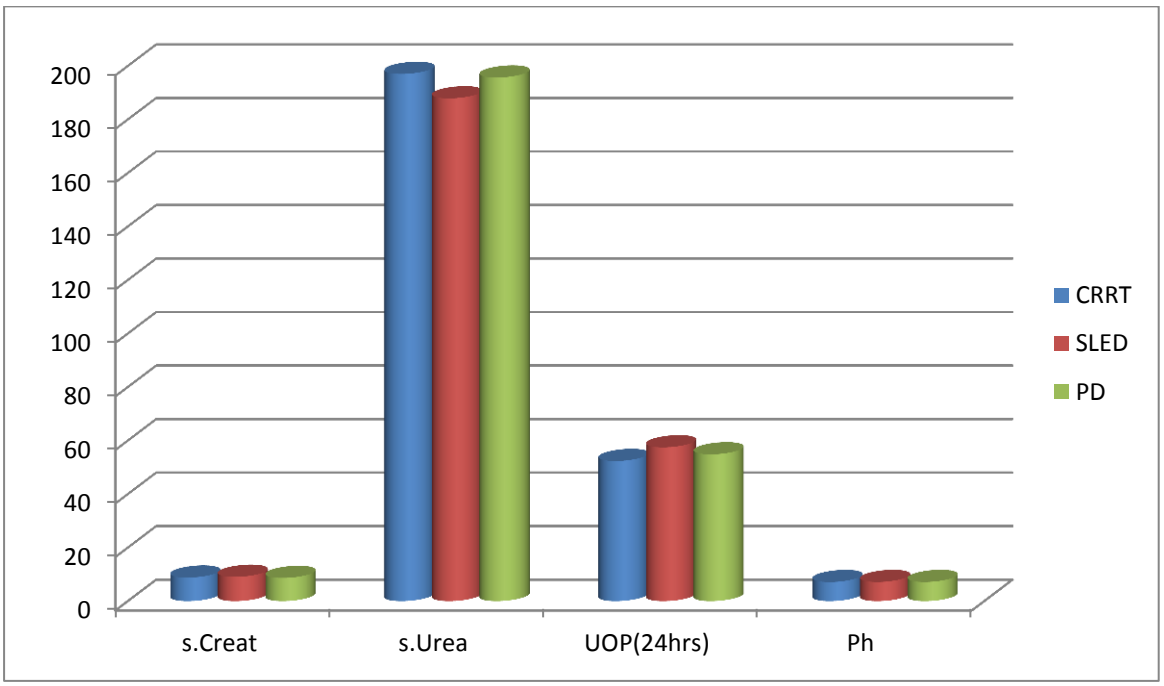


Figure 6: Admission day kidney function parameters

Indications of RRT:

The most common indication for RRT was metabolic acidosis in 66 patients (26.9%), followed closely by uremia in 63 (25.7%) and hyperkalemia in 62 patients (25.3%). The least common indication was fluid overload in 54 patients (22.0%). None of the indications were significantly different in between groups.

Table 11: Indications of RRT

		Group						Total	chi-square value	p-value
		CRRT (n=99)		SLED (n=108)		PD(n=38)				
Indications of RRT	Fluid overload	25	25.3%	20	18.5%	9	23.7%	54	4.057	0.669
	Hyperkalemia	26	26.3%	24	22.2%	12	31.6%	62		
	Uremia	24	24.2%	30	27.8%	9	23.7%	63		
	Metabolic acidosis	24	24.2%	34	31.5%	8	21.1%	66		

Etiology of AKI

The etiology of AKI in our study population was varied. Cardiac failure, pneumonia and sepsis were the three most common causes of AKI, playing the etiological role in 48, 46 and 41 patients respectively out of the total sample of 245 patients. Other common conditions leading to AKI in our patients were dengue (24 patients), pyelonephritis (21 patients), pregnancy related (17 patients), meningitis (12 patients), pancreatitis (11 patients) and malaria (10 patients). Among the uncommon etiological factors were leptospirosis (8 patients) and snake bite (7 patients). The contribution of each of these etiological factors was slightly varied among our three study groups, the analysis showed no statistical significance of the differences. In the smaller PD group of 38 patients, AKI secondary to causes like snake bite, malaria and leptospirosis was not seen.

Table 12: Etiology of AKI

		Group						Total	chi-square value	p-value
		CRRT (n=99)		SLED (n=108)		PD (n=38)				
Etiology of Aki	Pneumonia	19	19.2%	19	17.6%	8	21.1%	46	11.944	0.959
	Pyelonephritis	8	8.1%	10	9.3%	3	7.9%	21		
	Dengue	10	10.1%	10	9.3%	4	10.5%	24		
	Malaria	6	6.1%	4	3.7%	0	0.0%	10		
	Leptospirosis	3	3.0%	5	4.6%	0	0.0%	8		
	Undifferentiated sepsis	13	13.1%	19	17.6%	9	23.7%	41		
	Pregnancy related	9	9.1%	5	4.6%	3	7.9%	17		
	Meningitis	5	5.1%	6	5.6%	1	2.6%	12		
	Mancreatitis	4	4.0%	6	5.6%	1	2.6%	11		
	Snake bite	3	3.0%	4	3.7%	0	0.0%	7		
	Cardiogenic Failure	19	19.2%	20	18.5%	9	23.7%	48		

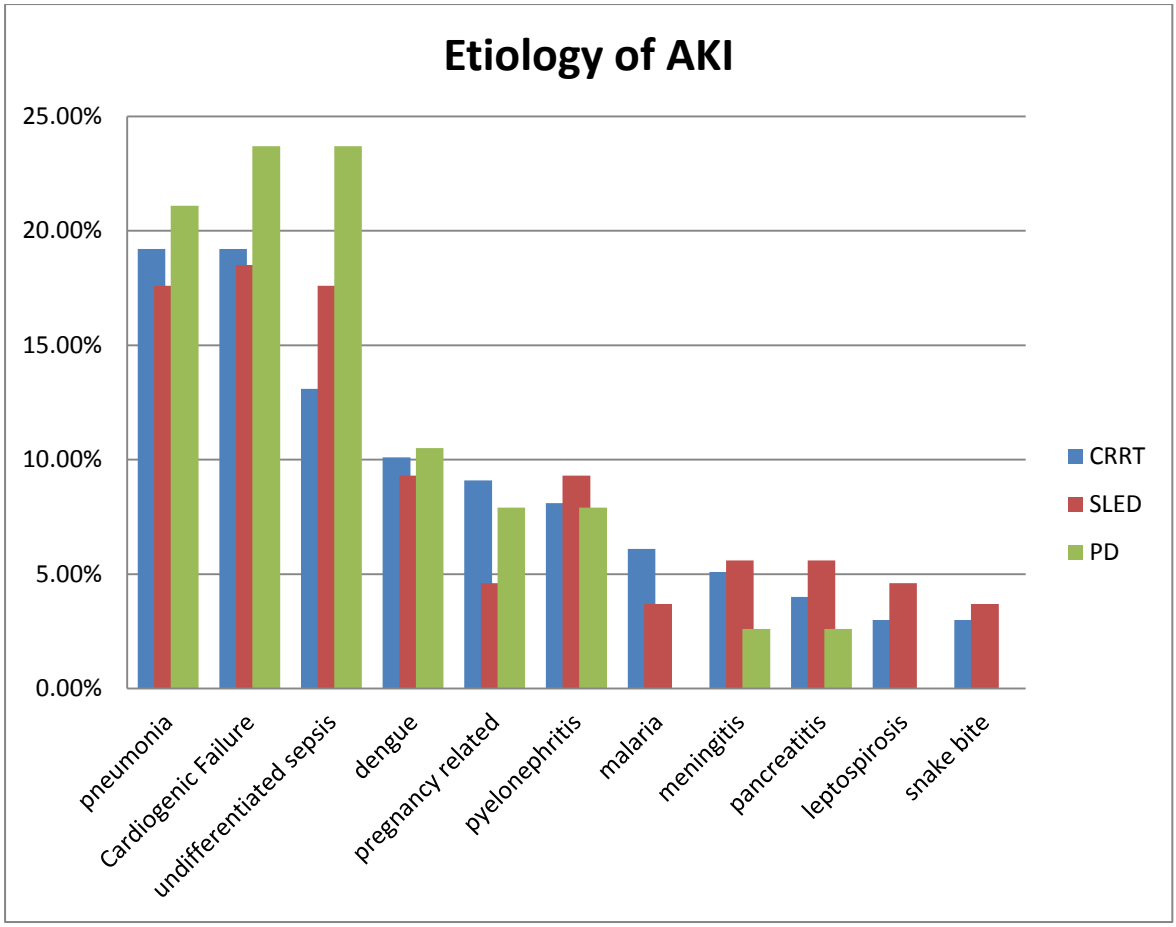


Figure 7: Etiology of AKI

If the above etiological factors were categorised into broad categories, these immediate causes could be roughly divided into three categories. Sepsis was the most common immediate cause, leading to AKI in 185 (75.5%) patients in total. An underlying cardiac cause was the precipitant in 52 patients (21.2%) while haemorrhage was the precipitating event in 8 patients (0.033%) The proportion of cases of AKI resulting from each of these three causal events was comparable among the study groups.

Table 13: Reason for AKI

		Group						Total	chi-square value	p-value
		CRRT (n=99)		SLED (n=108)		PD(n=38)				
Reason for AKI	sepsis	77	77.8%	79	73.1%	29	76.3%	185	2.375	0.667
	cardiac	19	19.2%	24	22.2%	9	23.7%	52		
	haemorrhage	3	3.0%	5	4.6%	0	0.0%	8		

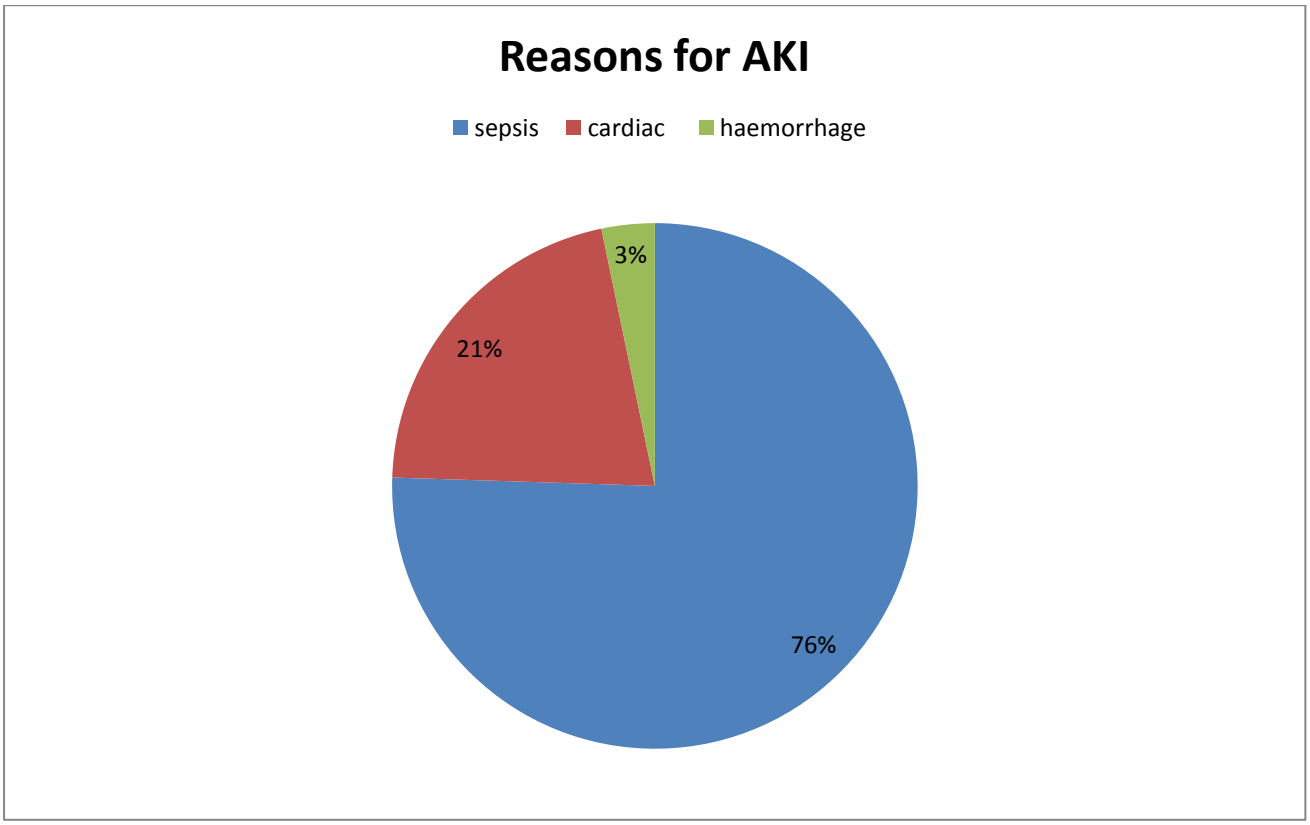


Figure 8: Reasons for AKI overall

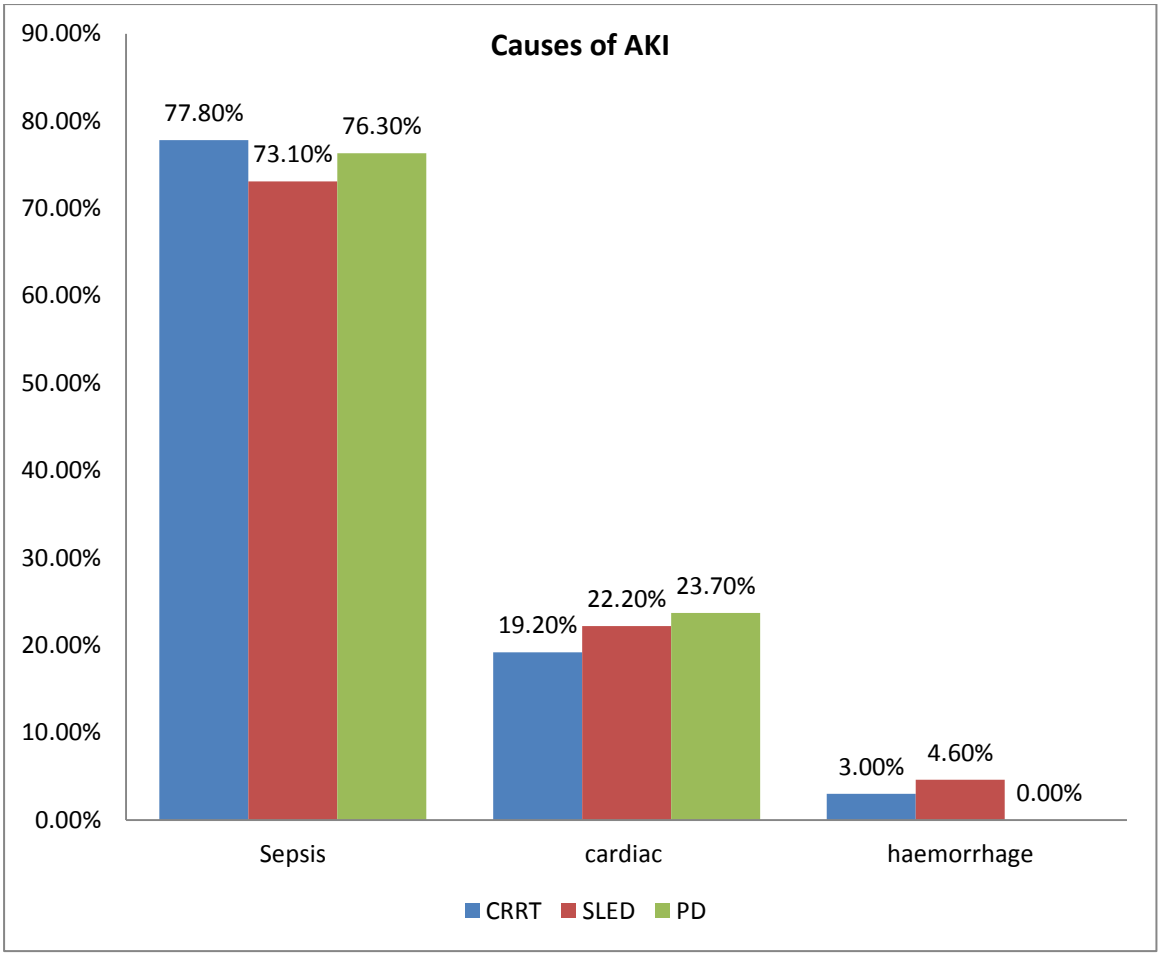


Figure 9: Cause for AKI (group wise)

On bases of the etiology or the precipitating illnesses leading to AKI in our patients, we divided the causes/precipitating factors into two major groups, medical and surgical. Overall, 95% (233 patients) of our total study population (245) belonged to the medical group while the rest 5% (12 patients) developed AKI secondary to surgical ailments. The proportion of medical to surgical patients in all the three groups was similar, medical group constituting 96.0 %, 93.5% and 97.4% of CRRT, SLED and PD groups, respectively.

Table 14: Category of patients

		Group						Total	chi-square value	p-value
		CRRT (n=99)		SLED (n=108)		PD(n=38)				
Major Category of patients	medical	95	96.0%	101	93.5%	37	97.4%	233	1.157	0.56
	surgical	4	4.0%	7	6.5%	1	2.6%	12		

On the basis of the type of ICU in which the patients were managed, we classified patients into those managed in medical-surgical ICU (MICU/SICU) and those managed in cardiac ICU (CCU). Overall, 189 (77 %) of the total sample were admitted in medical/surgical ICU while 56 (23%) patients were managed in cardiac ICU. While nearly 95% of the patients in the PD group were managed in MICU/SICU, this number was 73.7% in CRRT and 74.1% in SLED group. This difference is significant in absolute terms, statistical analysis also showed the p-value to be 0.019, probably because of small sample size of the PD group (38 out of 245 patients).

Table 15: ICU type

		Group						Total	chi-square value	p-value
		CRRT (n=99)		SLED (n=108)		PD(n=38)				
ICU type	medical-surgical	73	73.7%	80	74.1%	36	94.7%	189	7.899	0.019
	cardiovascular, CCU	26	26.3%	28	25.9%	2	5.3%	56		

Concomitant diseases

Most of our patients had one or more comorbidities present. The most common comorbid condition present in our patients was diabetes mellitus, present in 120 patients (49%) followed by hypertension and CKD, seen in 116 (47%) and 102 patients (42%), respectively. Other comorbidities were seen with varying frequency, CAD in 86 patients (35%), COPD in 41 (16%), CHF in 29 (11.8%), pancreatitis in 27 (11%), stroke in 22 (8.9%), and malignancy in 15 (6.1%) patients. Most patients concomitantly suffered more than one comorbid conditions. There was no significant difference in the distribution of these comorbidities among the three study groups.

Table 16: Comorbid conditions

		Group						Total	chi-square value	p-value
		CRRT (n=99)		SLED (n=108)		PD(n=38)				
DM	present	49	49.5%	51	47.2%	20	52.6%	120	0.347	0.84
	absent	50	50.5%	57	52.8%	18	47.4%	125		
HTN	present	51	51.5%	47	43.5%	18	47.4%	116	1.325	0.52
	absent	48	48.5%	61	56.5%	20	52.6%	129		
COPD	present	17	17.2%	18	16.7%	6	15.8%	41	0.038	0.98
	absent	82	82.8%	90	83.3%	32	84.2%	204		
CAD	present	36	36.4%	34	31.5%	13	34.2%	86	1.509	0.470
	absent	63	63.6%	74	68.5%	16	42.1%	159		
CKD	present	45	45.5%	41	38.0%	22	57.9%	102	1.197	0.550
	absent	54	54.5%	67	62.0%	22	57.9%	143		
CHF	present	14	14.1%	12	11.1%	3	7.9%	29	1.124	0.570
	absent	85	85.9%	96	88.9%	35	92.1%	216		
Neurology/ post stroke	present	10	10.1%	8	7.4%	4	10.5%	22	0.590	0.744
	absent	89	89.9%	100	92.6%	34	89.5%	223		
Malignancy	present	4	4.0%	9	8.3%	2	5.3%	15	1.714	0.424
	absent	95	96.0%	99	91.7%	36	94.7%	230		
Pancreatitis	present	13	13.1%	11	10.2%	3	7.9%	27	0.905	0.636
	absent	86	86.9%	97	89.8%	35	92.1%	218		

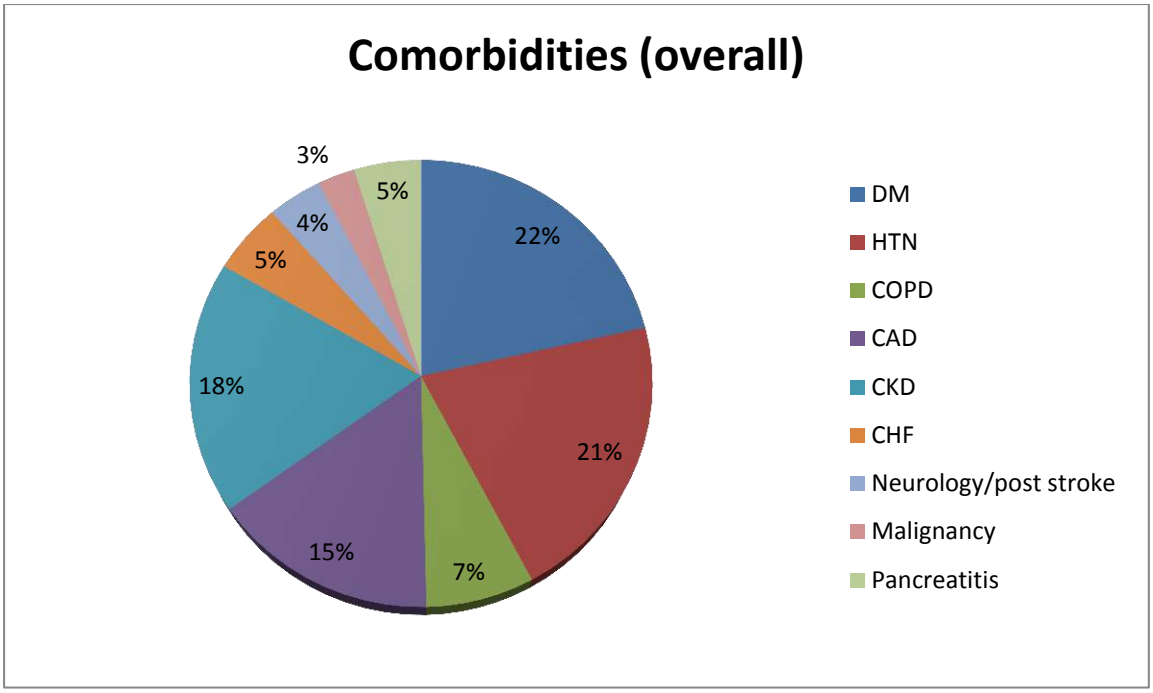
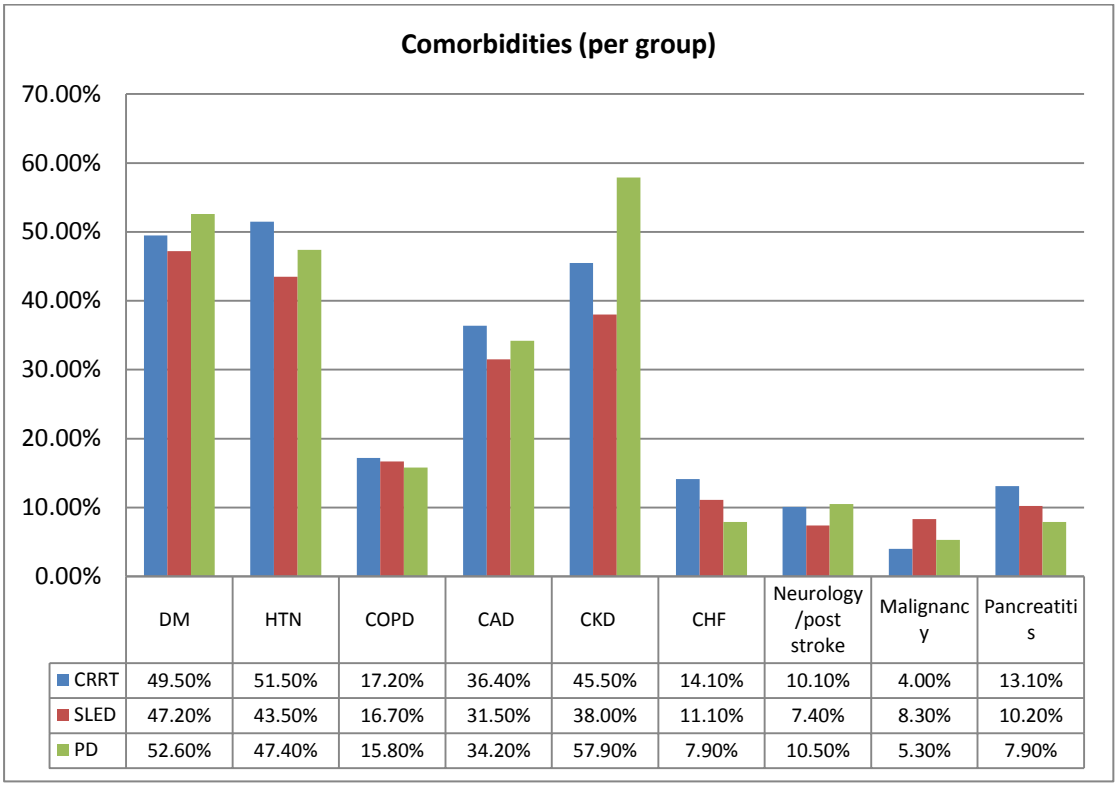


Figure 10: Comorbidities (overall)



	DM	HTN	COPD	CAD	CKD	CHF	Neurology /post stroke	Malignancy	Pancreatitis
CRRT	49.50%	51.50%	17.20%	36.40%	45.50%	14.10%	10.10%	4.00%	13.10%
SLED	47.20%	43.50%	16.70%	31.50%	38.00%	11.10%	7.40%	8.30%	10.20%
PD	52.60%	47.40%	15.80%	34.20%	57.90%	7.90%	10.50%	5.30%	7.90%

Figure 11: Comorbidities (per group)

Baseline disease severity parameters

On the day of admission, the SOFA score was assessed and the overall mean SOFA score of the total sample was 14.53 while the group wise SOFA score was 14.79, 13.83 and 15.84 in CRRT, SLED and PD groups, respectively. The mean SOFA score was highest in PD group, followed by CRRT group, while patients in the SLED group had the lowest mean SOFA score on day one. Though the SOFA score of PD group was higher than CRRT group (15.84 vs 14.79), the difference was not statistically significant. But the comparison between mean SOFA score of CRRT vs SLED and SLED vs PD were of statistical significance with p-value < 0.005, which means the patients in both PD and CRRT groups had significantly higher SOFA score in comparison to SLED group.

Table 17: Day 1 SOFA scores

	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
SOFA score day 1	14.79	2.83	13.83	1.73	15.84	1.91	12.135	0.001	0.003	0.015	0.001

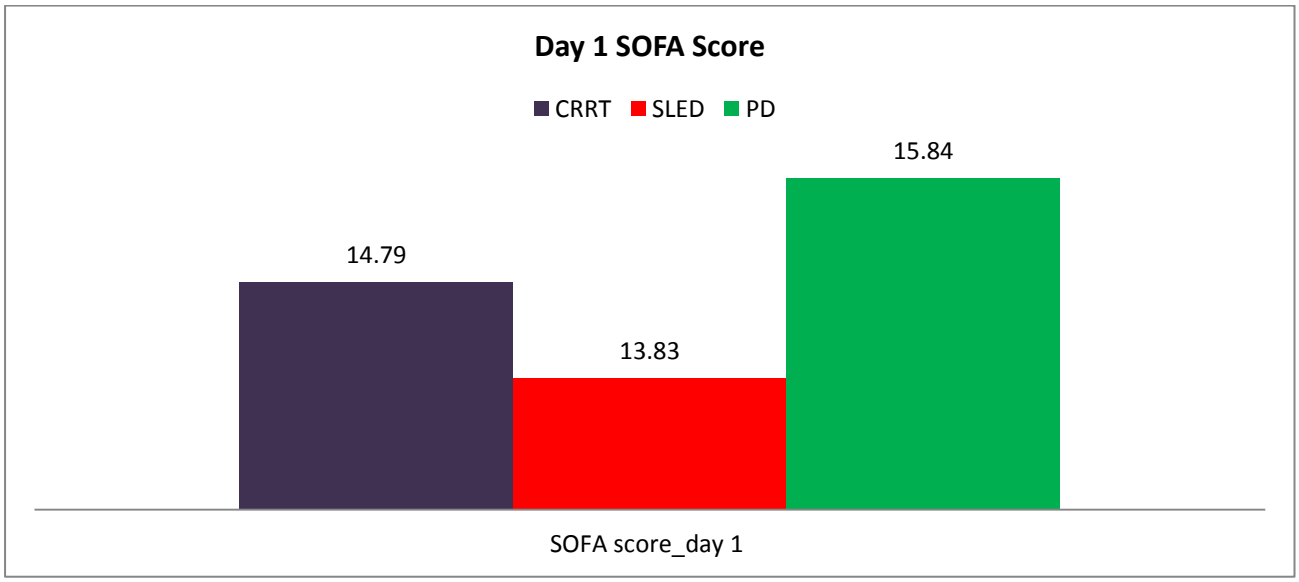


Figure 12: Day 1 SOFA scores

Overall 60% of our total sample population needed mechanical ventilation while the rest 40% did not. Comparable proportions of patients in all three groups were in need of mechanical ventilation on admission.

Table 18: Need for mechanical ventilation

		Group						Total	chi-square value	p-value
		CRRT (n=99)		SLED (n=108)		PD(n=38)				
Need for mechanical ventilation.	present	66	66.7%	59	54.6%	22	57.9%	147	3.201	0.202
	absent	33	33.3%	49	45.4%	16	42.1%	98		

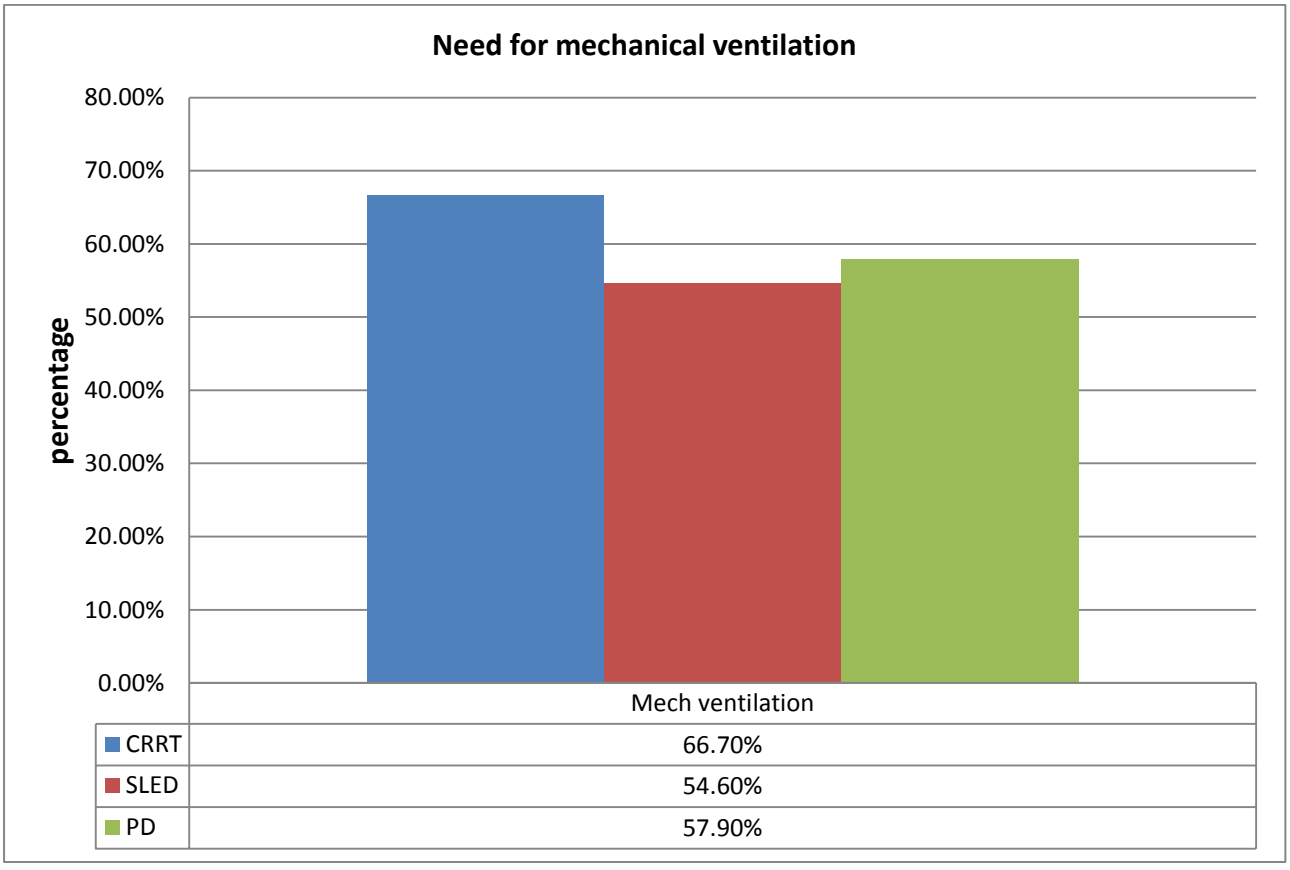


Figure 13: Need for mechanical ventilation

All of our patients required vasopressor support from the day of admission, as our study was based only on the patients who required vasopressor support.

Table 19: Need for vasopressor on admission

		Group						Total	chi-square value	p-value
		CRRT (n=99)		SLED (n=108)		PD(n=38)				
Need for vasopressor day 1	1	99	100.0%	108	100.0%	38	100.0%	245		

Hemodynamic parameters:

All our patients showed varied degrees of circulatory failure and shock with raised heart rate (HR) (overall mean 113.4 bpm) , decreased BP (overall mean MAP 67.65 mmHg, overall mean SBP 90.35 and DBP of 61.96 mmHg), and raised CVP (overall mean 13.06 cm H2O) (indicative of increased preload and fluid overload state).

Table 20: Hemodynamic parameters on day one

	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
HR day 1	113.83	13.47	112.79	12.04	114.05	14.61	0.220	0.803	0.567	0.928	0.607
CVP day 1	12.89	2.21	13.14	2.40	13.29	2.32	0.521	0.595	0.438	0.365	0.730
SBP	90.22	4.89	90.37	4.92	90.63	4.49	0.100	0.905	0.826	0.658	0.775
DBP	61.97	5.47	62.02	5.28	61.76	3.48	0.035	0.965	0.945	0.833	0.792

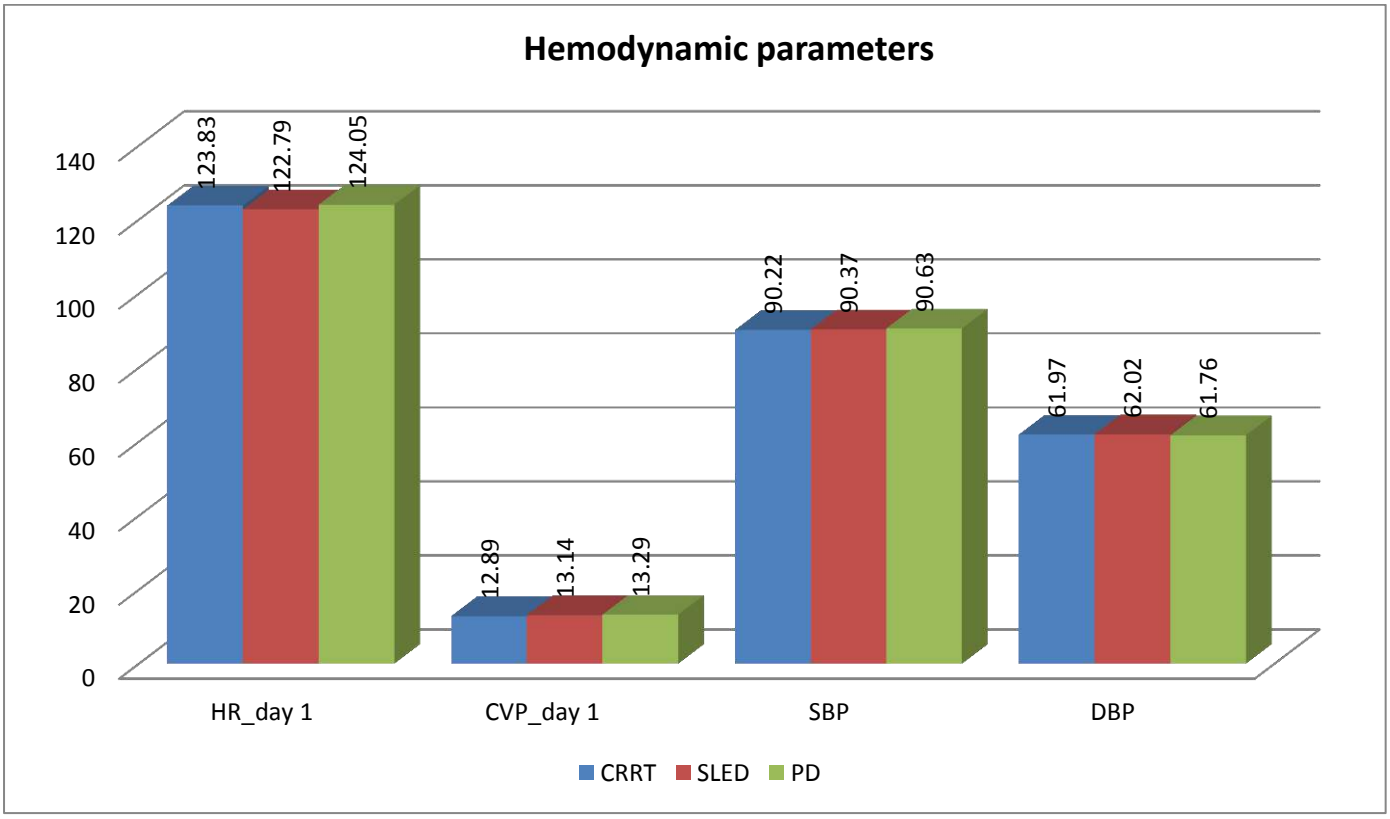


Figure 14: Hemodynamic parameters on day one

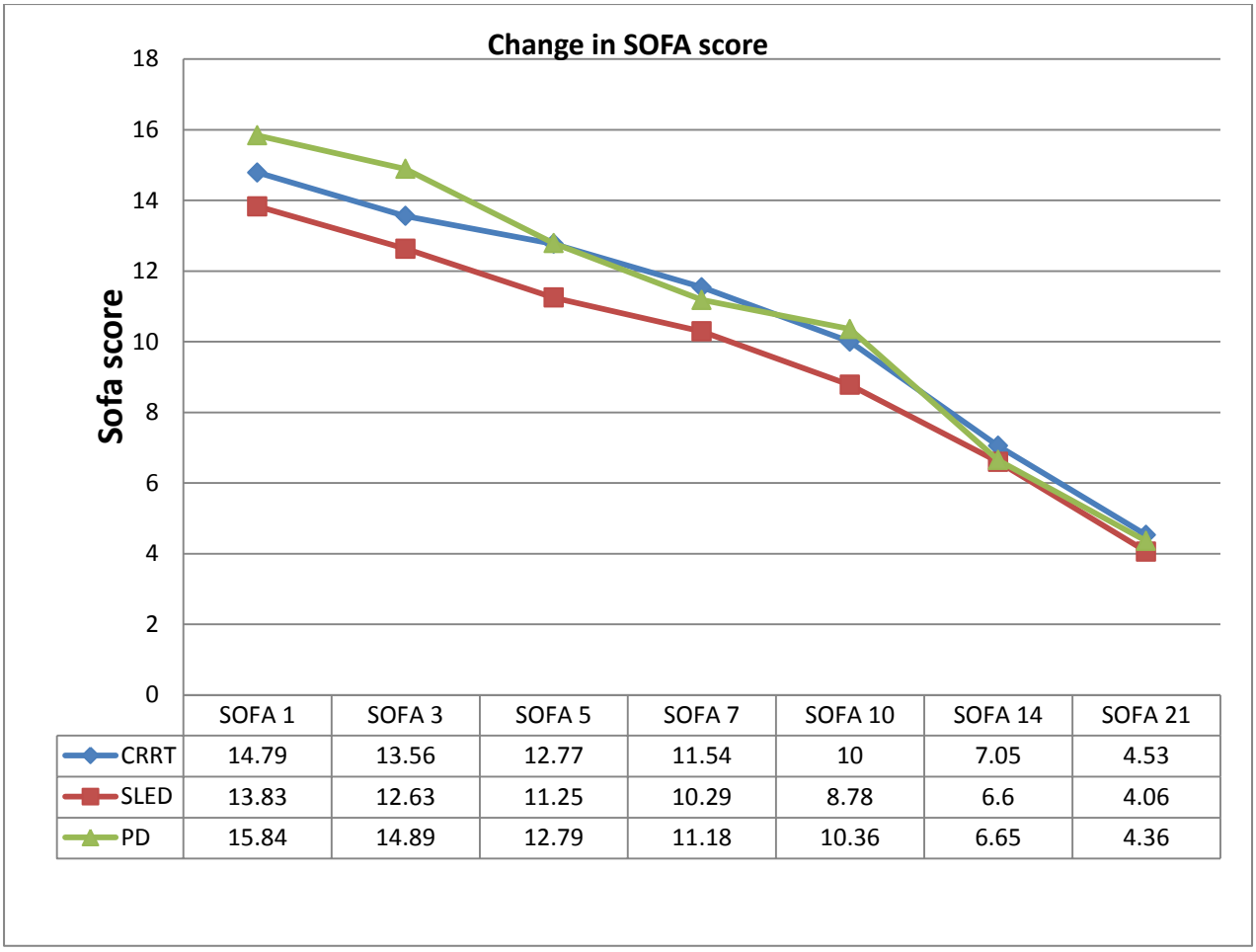
Course of disease severity (physiological parameters)

Improvement in SOFA score:

We assessed the SOFA scores in all patients on day 1, 3, 5, 7, 10, 14 and 21. As already observed, the mean SOFA score in the beginning was highest in PD group (15.84), followed by CRRT group (14.79) and least in SLED group (13.83) with statistically significant difference between CRRT vs SLED and SLED vs PD groups on day One. On day 3, there was some improvement in SOFA scores in all three groups, but the mean scores still differed significantly between all three groups. (p-value 0.001), and this significant difference was seen up to day 10. The progression in mean SOFA scores is shown in table 18 below and plotted on the graph below.

Table 21: Change in SOFA scores

	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
SOFA score day 1	14.79	2.83	13.83	1.73	15.84	1.91	12.135	0.001	0.003	0.015	0.001
SOFA score day 3	13.56	2.27	12.63	1.66	14.89	1.87	19.335	0.001	0.001	0.001	0.001
SOFA score day 5	12.77	3.03	11.25	2.44	12.79	2.47	8.862	0.001	0.001	0.970	0.007
SOFA score day 7	11.54	3.67	10.29	2.50	11.18	3.62	3.458	0.033	0.010	0.608	0.197
SOFA score day 10	10.00	4.10	8.78	2.39	10.36	3.16	4.016	0.020	0.014	0.644	0.042
SOFA score day 14	7.05	2.38	6.60	2.04	6.65	2.09	0.680	0.508	0.260	0.504	0.937
SOFA score day 21	4.53	1.91	4.06	0.86	4.36	0.93	1.404	0.250	0.099	0.677	0.476



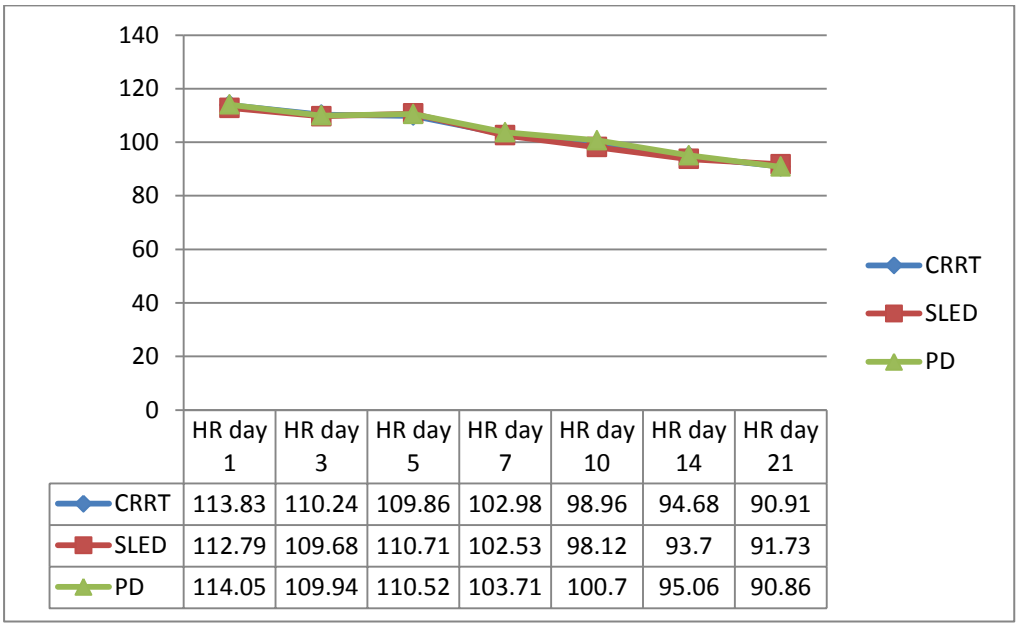
	SOFA 1	SOFA 3	SOFA 5	SOFA 7	SOFA 10	SOFA 14	SOFA 21
CRRT	14.79	13.56	12.77	11.54	10	7.05	4.53
SLED	13.83	12.63	11.25	10.29	8.78	6.6	4.06
PD	15.84	14.89	12.79	11.18	10.36	6.65	4.36

Figure 15: Change in SOFA score

The other physiological parameters like HR, MAP, CVP and 24 hour urine output were measured and tabulated on day 1, 3, 5, 7, 10 and 14 and 21. The mean values of these parameters did not differ significantly between the three groups. All these parameters showed gradual improvement over time with mean values at no point differing significantly between the three groups. The heart rate improved from an overall mean of 113.4 bpm on day one to 91.28 bpm on day 21, showing a decrease in the level of tachycardia by about 22 bpm. Similarly, the overall mean MAP improved from 67.65 mmHg on day one to 77.18 mmHG on day 21, showing an average increase of approx. 10 mmHG, indicative of correction of shock. There was a gradual decrease in overall mean CVP from 13.06 cm of H20 at day one to 8.20 cm of H2O on day 21, which indicates successful or partial correction of fluid overload. The mean urine output improved from 550.12 ml/24 hours on day one to 2195.18 ml/24 on day 21.

The gradual improvement of these parameters was comparable in all three modalities of RRT (CRRT, SLED and PD) at improving the hemodynamic parameters.

The graph below plots the improvement in these parameters over time.



	HR day 1	HR day 3	HR day 5	HR day 7	HR day 10	HR day 14	HR day 21
CRRT	113.83	110.24	109.86	102.98	98.96	94.68	90.91
SLED	112.79	109.68	110.71	102.53	98.12	93.7	91.73
PD	114.05	109.94	110.52	103.71	100.7	95.06	90.86

Figure 16: Change in Heart rate

Table 22: Change in Heart rate											
	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
HR day 1	113.83	13.47	112.79	12.04	114.05	14.61	0.220	0.803	0.567	0.928	0.607
HR day 3	110.24	13.25	109.68	12.61	109.94	14.74	0.046	0.956	0.763	0.909	0.921
HR day 5	109.86	13.35	110.71	12.15	110.52	12.99	0.111	0.895	0.643	0.809	0.943
HR day 7	102.98	10.80	102.53	9.11	103.71	8.73	0.172	0.842	0.756	0.729	0.570
HR day 10	98.96	7.91	98.12	8.40	100.70	8.14	0.963	0.384	0.496	0.371	0.177
HR day 14	94.68	8.78	93.70	7.61	95.06	10.74	0.307	0.736	0.511	0.873	0.552
HR day 21	90.91	7.11	91.73	6.01	90.86	5.59	0.226	0.798	0.538	0.978	0.656

Table 23: Change in mean arterial pressure (mmHg)											
	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
MAP day 1	67.07	7.21	68.39	4.74	67.05	6.31	1.426	0.242	0.121	0.988	0.246
MAP day 3	66.82	5.14	67.83	5.60	65.76	3.99	2.303	0.102	0.171	0.313	0.045
MAP day 5	67.40	6.06	68.43	4.76	68.90	5.81	1.239	0.292	0.192	0.200	0.683
MAP day 7	68.14	6.30	69.41	6.87	69.59	6.21	1.053	0.351	0.185	0.305	0.900
MAP day 10	70.07	7.20	71.96	8.70	70.08	7.61	1.412	0.246	0.116	0.995	0.305
MAP day 14	73.25	6.51	75.62	7.63	74.74	8.14	1.723	0.182	0.066	0.441	0.640
MAP day 21	76.80	5.81	77.24	7.62	78.21	3.89	0.253	0.777	0.746	0.481	0.621

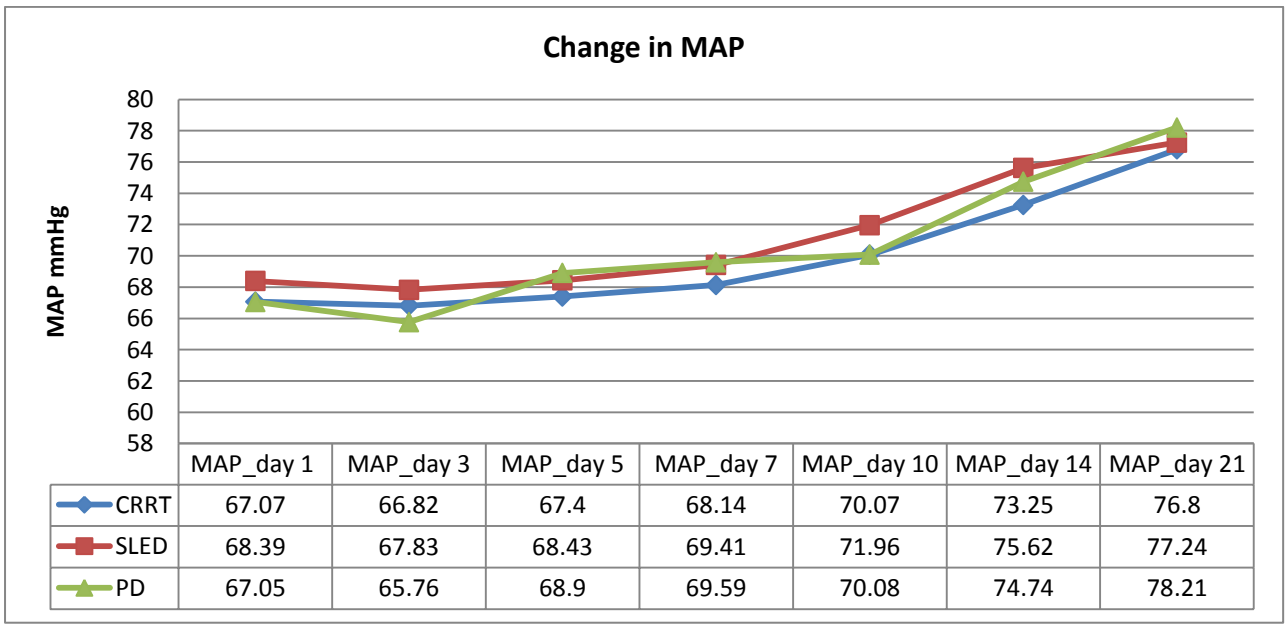


Figure 17: Change in mean arterial pressure (mmHg)

Table 24: Change in Central Venous Pressure											
	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
CVP day 1	12.89	2.21	13.14	2.40	13.29	2.32	0.521	0.595	0.438	0.365	0.730
CVP day 3	11.23	1.65	11.36	2.27	10.71	1.45	1.459	0.235	0.659	0.174	0.090
CVP day 5	10.09	1.67	10.17	2.00	9.83	1.75	0.404	0.668	0.740	0.509	0.370
CVP day 7	8.87	1.23	9.19	2.11	8.96	1.26	0.812	0.446	0.211	0.805	0.544
CVP day 10	8.83	9.06	8.08	1.82	7.70	1.49	0.502	0.606	0.405	0.420	0.779
CVP day 14	7.44	1.78	7.49	1.60	6.94	1.73	0.721	0.488	0.888	0.292	0.237

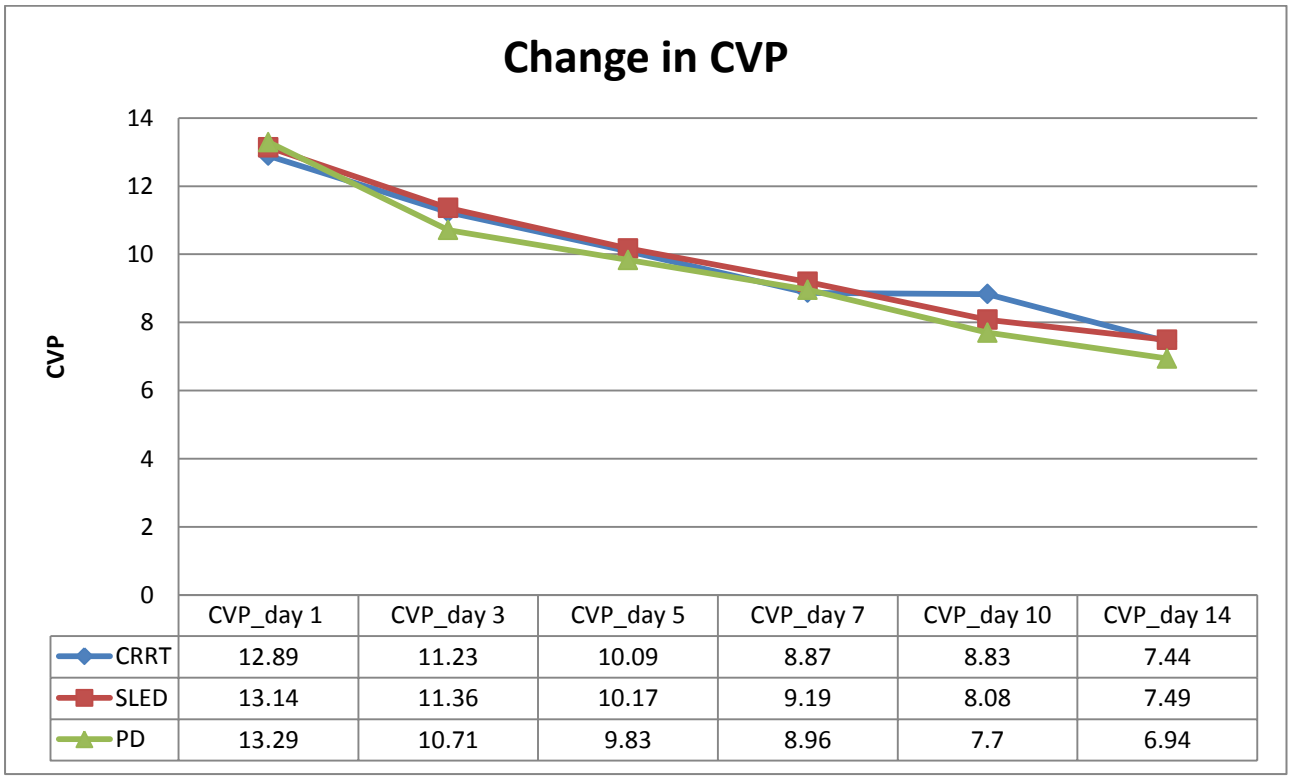
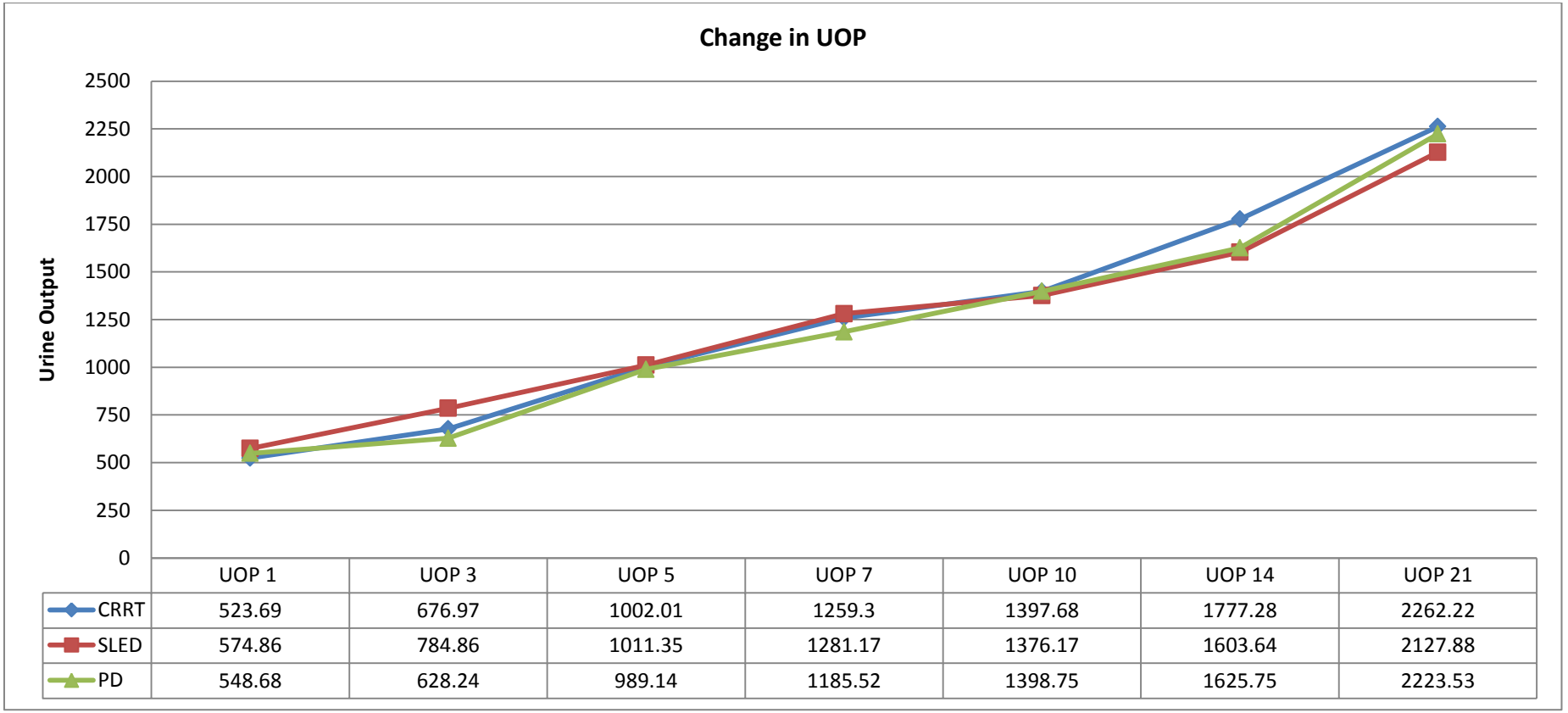


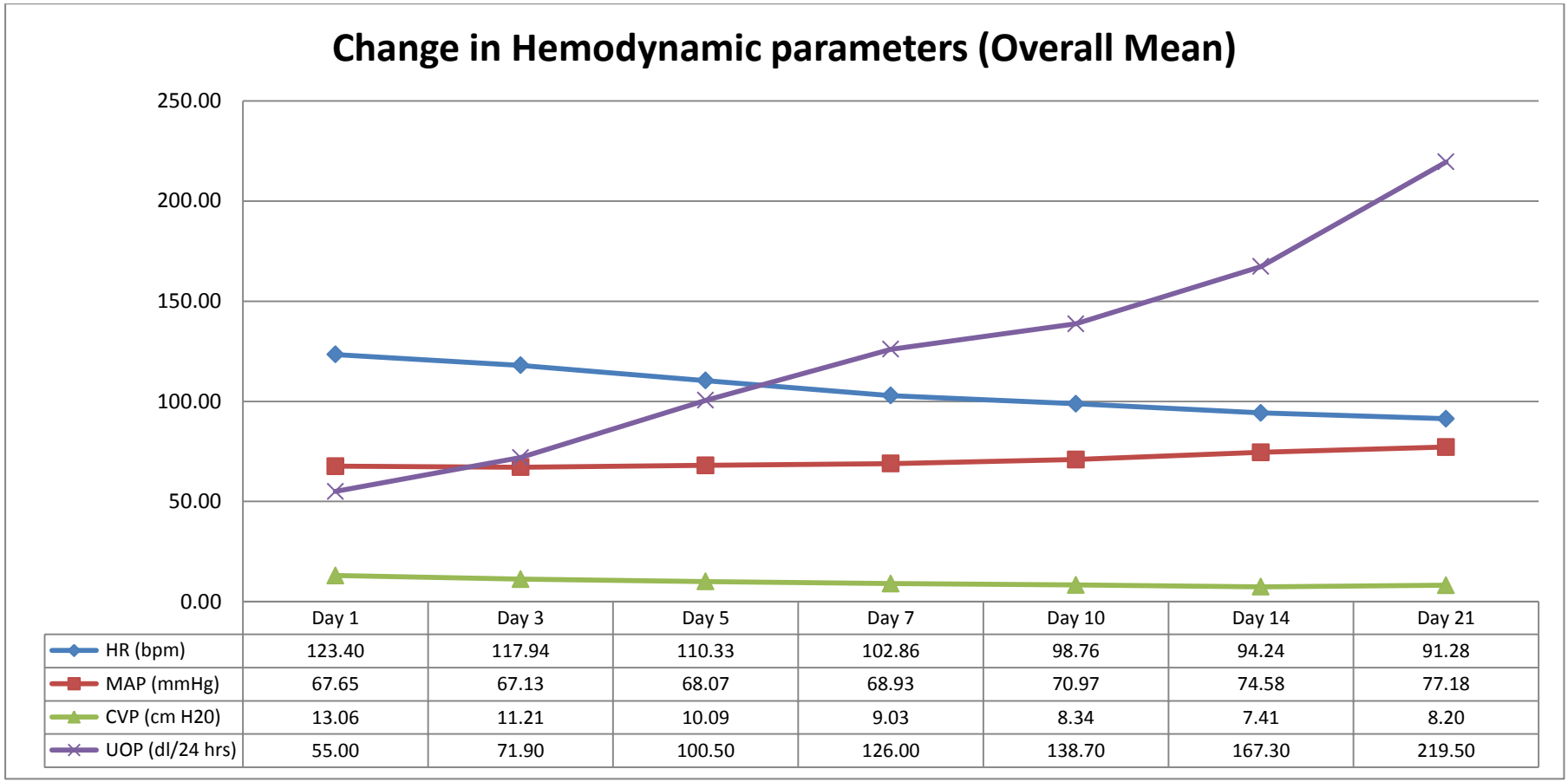
Figure 18: Change in Central Venous Pressure

Table 25: Change in Urine Output (mL/24 hours)											
	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
UOP (24hrs) day 1	523.69	257.06	574.86	217.55	548.68	214.19	1.237	0.292	0.117	0.576	0.553
UOP (24hrs) day 3	676.97	331.02	784.86	509.68	628.24	301.32	2.593	0.077	0.070	0.562	0.059
UOP (24hrs) day 5	1002.01	426.09	1011.35	483.15	989.14	424.07	0.030	0.971	0.886	0.894	0.816
UOP (24hrs) day 7	1259.30	527.52	1281.17	642.66	1185.52	625.47	0.290	0.749	0.802	0.566	0.447
UOP (24hrs) day 10	1397.68	647.26	1376.17	631.21	1398.75	618.96	0.030	0.971	0.822	0.994	0.876
UOP (24hrs) day 14	1777.28	882.73	1603.64	835.97	1625.75	959.23	0.659	0.519	0.266	0.504	0.920
UOP (24hrs) day 21	2262.22	908.81	2127.88	780.56	2223.53	966.00	0.304	0.738	0.445	0.875	0.692



	UOP 1	UOP 3	UOP 5	UOP 7	UOP 10	UOP 14	UOP 21
CRRT	523.69	676.97	1002.01	1259.3	1397.68	1777.28	2262.22
SLED	574.86	784.86	1011.35	1281.17	1376.17	1603.64	2127.88
PD	548.68	628.24	989.14	1185.52	1398.75	1625.75	2223.53

Figure 19: Change in Urine Output (mL/24 hours)



	Day 1	Day 3	Day 5	Day 7	Day 10	Day 14	Day 21
HR (bpm)	123.40	117.94	110.33	102.86	98.76	94.24	91.28
MAP (mmHg)	67.65	67.13	68.07	68.93	70.97	74.58	77.18
CVP (cm H20)	13.06	11.21	10.09	9.03	8.34	7.41	8.20
UOP (dl/24 hrs)	55.00	71.90	100.50	126.00	138.70	167.30	219.50

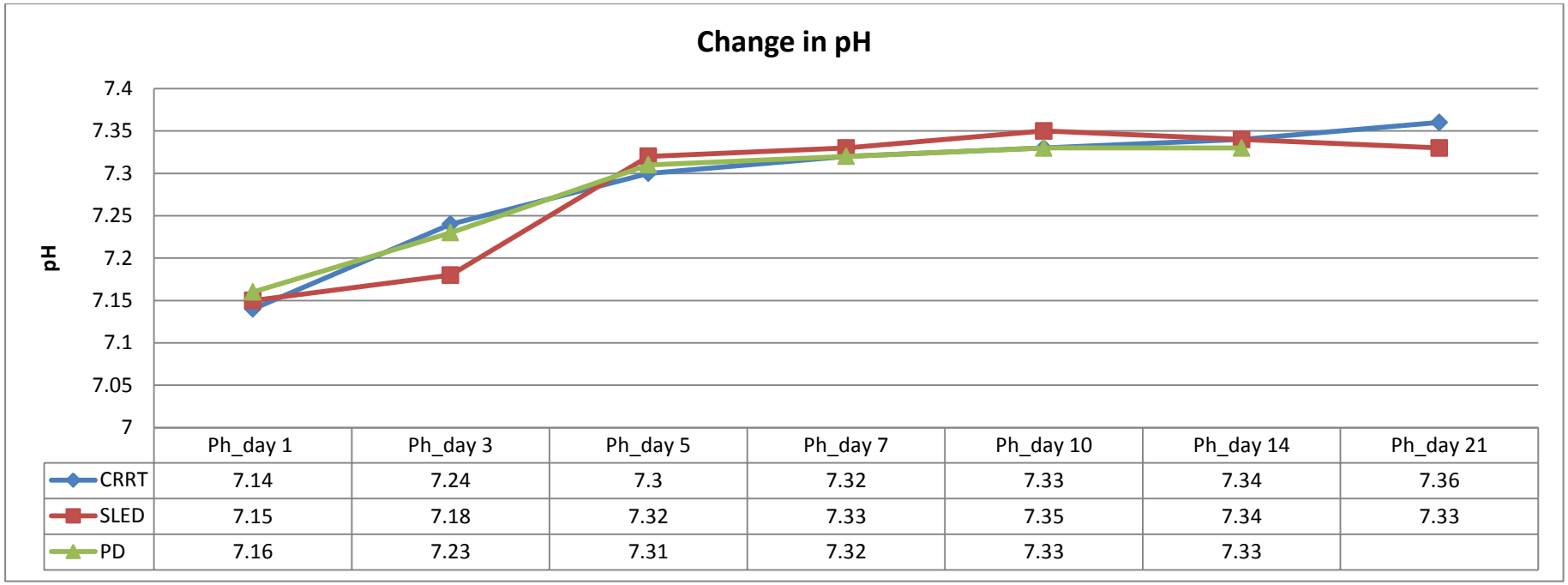
Figure 20: Change in hemodynamic parameters (Overall Mean)

Course of disease severity (laboratory indices)

As previously seen, all the patients from all three study groups had severe metabolic acidosis on the day of admission (overall mean 7.14), with no significant intergroup variation. After the patients were put on an appropriate modality of RRT, we measured the changes in pH over time and tabulated them on day 1, 3, 5, 7, 10, 14 and 21. Patients acid-base balance improved over time in all the three groups. Following table and graph represent the gradual correction of acidosis in the three study groups.

Table 26: Change in pH

	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
Ph_day 1	7.14	0.06	7.15	0.05	7.16	0.06	2.050	0.131	0.128	0.072	0.482
Ph_day 3	7.24	0.05	7.18	0.69	7.23	0.07	0.474	0.623	0.349	0.909	0.578
Ph_day 5	7.30	0.10	7.32	0.09	7.31	0.12	1.198	0.304	0.131	0.407	0.846
Ph_day 7	7.32	0.05	7.33	0.07	7.32	0.05	0.940	0.392	0.196	0.954	0.407
Ph_day 10	7.33	0.04	7.35	0.07	7.33	0.03	2.591	0.077	0.025	0.637	0.328
Ph_day 14	7.34	0.04	7.34	0.06	7.33	0.06	0.948	0.390	0.875	0.185	0.210
Ph_day 21	7.36	0.06	7.33	0.06	.	.	5.277	0.024			



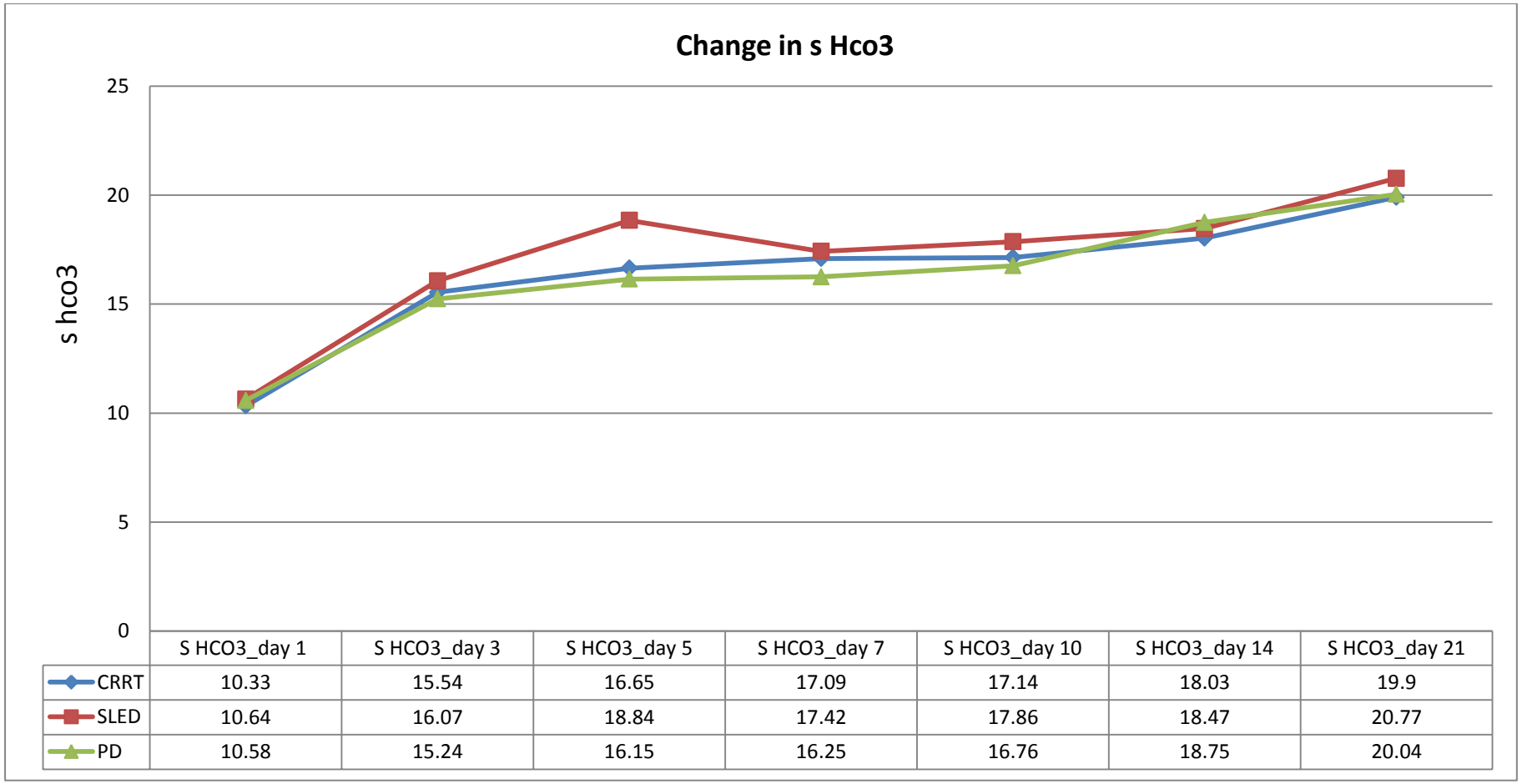
	Ph_day 1	Ph_day 3	Ph_day 5	Ph_day 7	Ph_day 10	Ph_day 14	Ph_day 21
CRRT	7.14	7.24	7.3	7.32	7.33	7.34	7.36
SLED	7.15	7.18	7.32	7.33	7.35	7.34	7.33
PD	7.16	7.23	7.31	7.32	7.33	7.33	

Figure 21: Change in pH

Similarly we tabulated the progress of other metabolic parameters over the same time in all three groups including serum lactate, serum bicarbonate, serum urea and serum creatinine levels. In all the measurements we found that these parameters did not differ significantly between the three groups on day 1, and all parameters showed gradual correction over 21 days, irrespective of the RRT modality used. At no point of time was the difference in these parameters significant between the three modalities.

Table 27: Change in serum bicarbonate levels

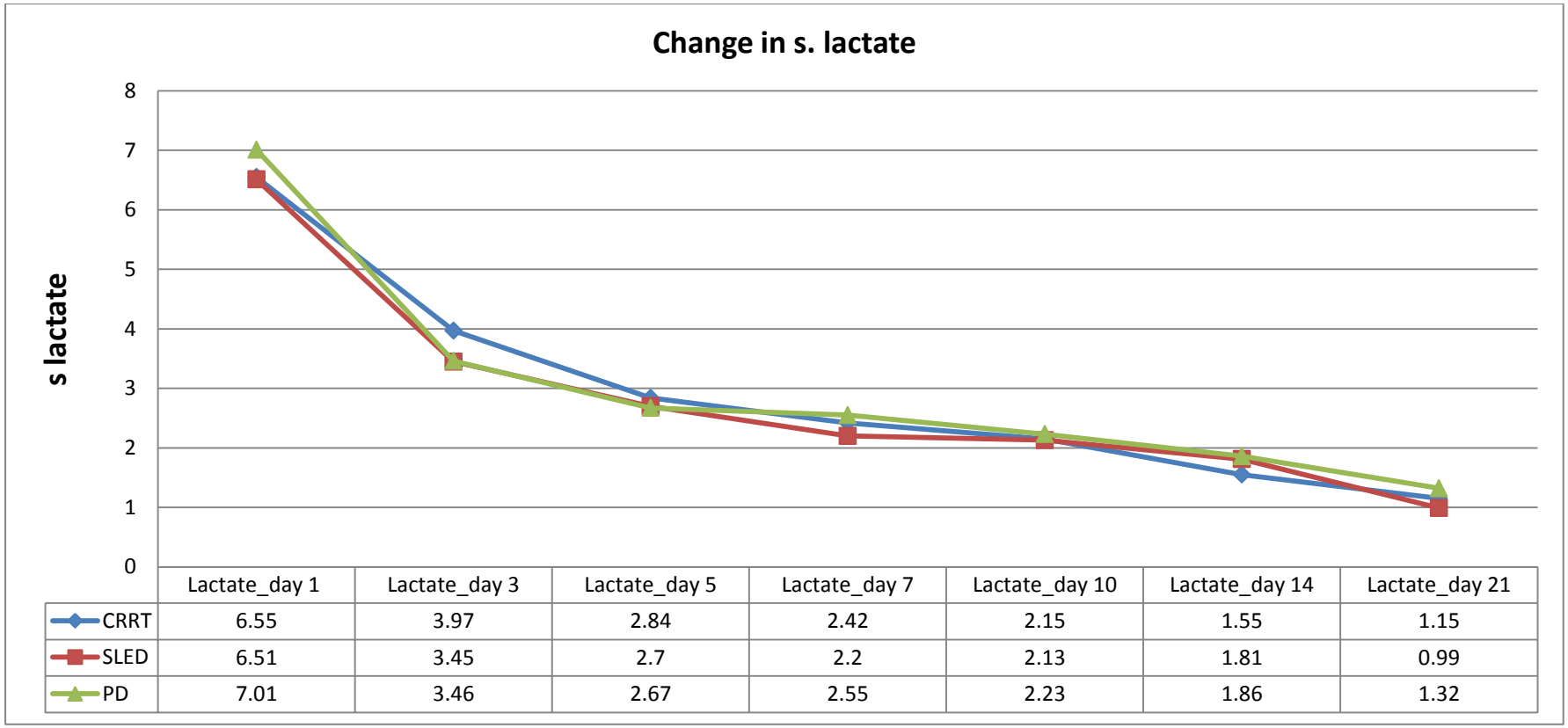
	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
S HCO3_day 1	10.33	1.81	10.64	2.13	10.58	1.93	0.668	0.514	0.262	0.500	0.884
S HCO3_day 3	15.54	2.82	16.07	2.90	15.24	2.52	1.481	0.230	0.188	0.601	0.140
S HCO3_day 5	16.65	3.87	18.84	10.44	16.15	3.56	2.618	0.075	0.056	0.755	0.093
S HCO3_day 7	17.09	4.31	17.42	3.74	16.25	4.63	0.900	0.408	0.583	0.349	0.183
S HCO3_day 10	17.14	4.11	17.86	3.12	16.76	3.97	1.346	0.263	0.185	0.657	0.192
S HCO3_day 14	18.03	4.13	18.47	2.98	18.75	5.81	0.325	0.723	0.520	0.493	0.787
S HCO3_day 21	19.90	3.72	20.77	1.90	20.04	3.48	1.129	0.327	0.151	0.878	0.399



	S HCO3_day 1	S HCO3_day 3	S HCO3_day 5	S HCO3_day 7	S HCO3_day 10	S HCO3_day 14	S HCO3_day 21
CRRT	10.33	15.54	16.65	17.09	17.14	18.03	19.9
SLED	10.64	16.07	18.84	17.42	17.86	18.47	20.77
PD	10.58	15.24	16.15	16.25	16.76	18.75	20.04

Figure 22: Change in serum bicarbonate levels

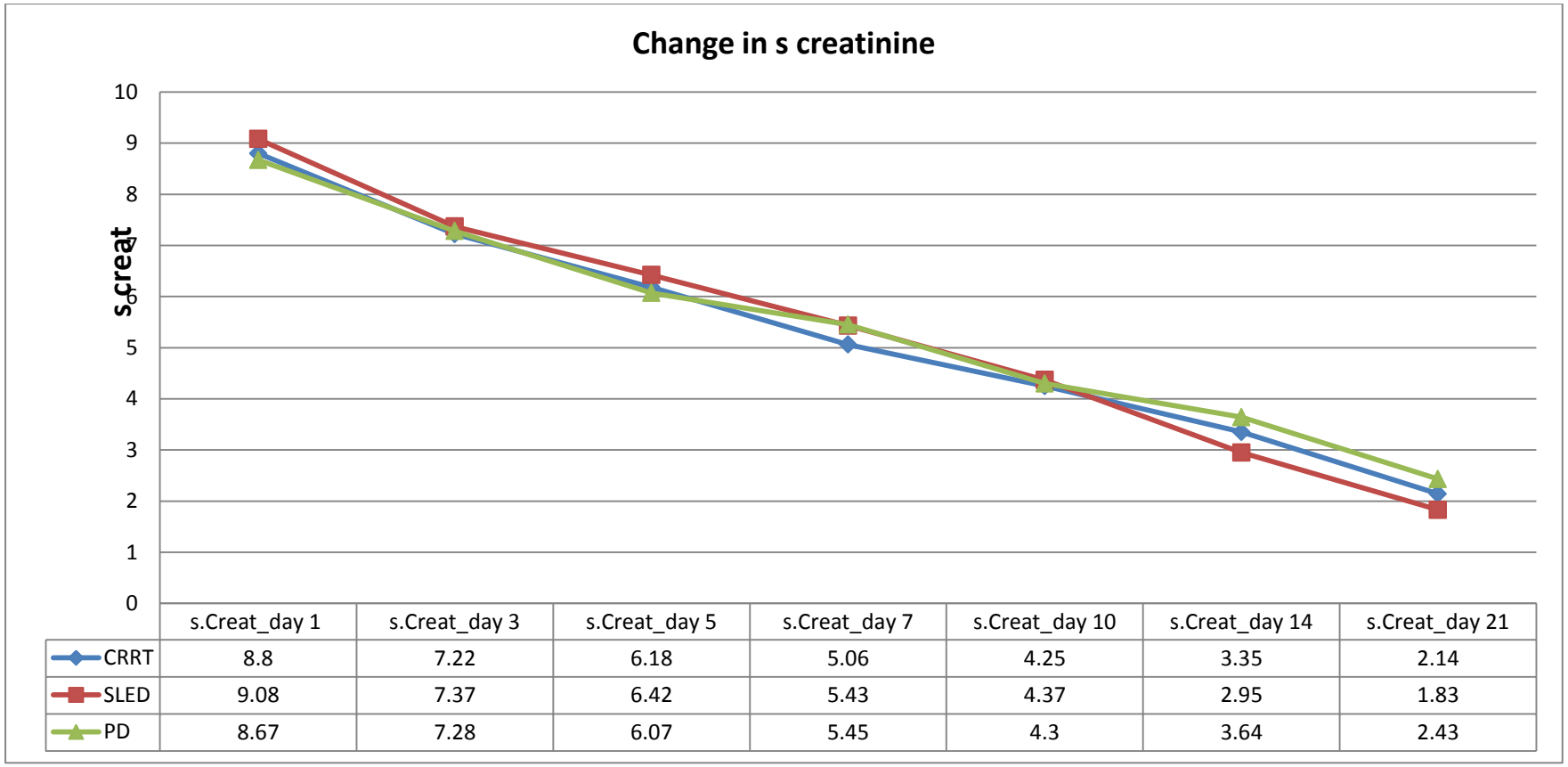
Table 28: Change in serum lactate levels (mEq/L)											
	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
Lactate_day 1	6.55	1.95	6.51	2.26	7.01	2.16	0.837	0.434	0.892	0.256	0.212
Lactate_day 3	3.97	1.72	3.45	1.58	3.46	1.09	3.100	0.057	0.060	0.098	0.972
Lactate_day 5	2.84	1.08	2.70	1.81	2.67	0.72	0.297	0.743	0.489	0.574	0.922
Lactate_day 7	2.42	0.84	2.20	1.50	2.55	0.97	1.269	0.283	0.224	0.612	0.177
Lactate_day 10	2.15	0.93	2.13	1.63	2.23	0.90	0.052	0.950	0.930	0.796	0.748
Lactate_day 14	1.55	0.58	1.81	1.88	1.86	0.77	0.675	0.511	0.286	0.418	0.900
Lactate_day 21	1.15	0.66	0.99	0.50	1.32	0.72	2.168	0.119	0.177	0.346	0.056



	Lactate_day 1	Lactate_day 3	Lactate_day 5	Lactate_day 7	Lactate_day 10	Lactate_day 14	Lactate_day 21
CRRT	6.55	3.97	2.84	2.42	2.15	1.55	1.15
SLED	6.51	3.45	2.7	2.2	2.13	1.81	0.99
PD	7.01	3.46	2.67	2.55	2.23	1.86	1.32

Figure 23: Change in serum lactate levels (mEq/L)

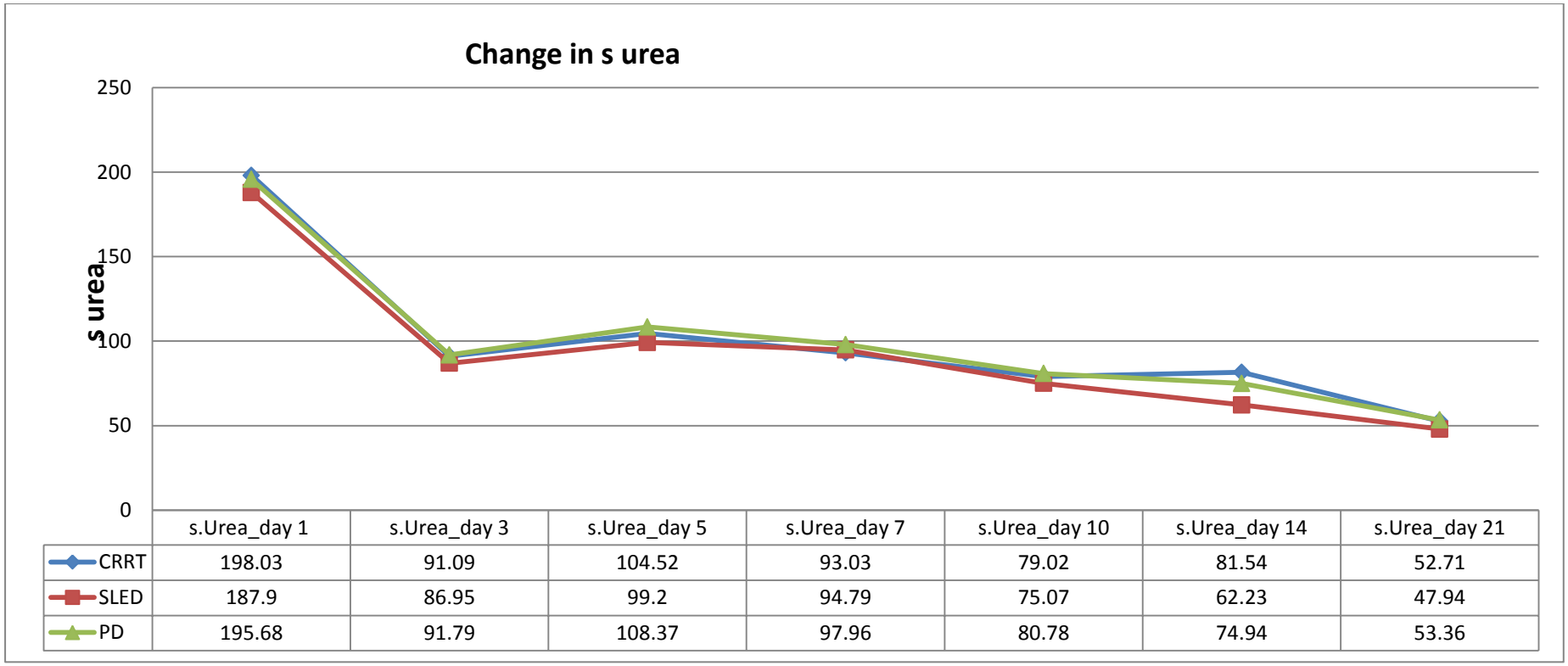
Table 29: Change in serum creatinine levels (mg/dL)											
	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
s.Creat_day 1	8.80	1.68	9.08	1.63	8.67	1.57	1.211	0.300	0.226	0.660	0.181
s.Creat_day 3	7.22	1.64	7.37	1.81	7.28	1.61	0.186	0.831	0.546	0.875	0.784
s.Creat_day 5	6.18	1.49	6.42	1.77	6.07	1.35	0.833	0.436	0.294	0.745	0.296
s.Creat_day 7	5.06	1.25	5.43	1.65	5.45	1.19	1.816	0.165	0.075	0.207	0.950
s.Creat_day 10	4.25	1.30	4.37	1.46	4.30	1.33	0.154	0.858	0.581	0.881	0.837
s.Creat_day 14	3.35	1.30	2.95	1.26	3.64	1.63	2.633	0.075	0.091	0.414	0.059
s.Creat_day 21	2.14	1.37	1.83	1.23	2.43	2.06	1.277	0.283	0.290	0.486	0.143



	s.Creat_day 1	s.Creat_day 3	s.Creat_day 5	s.Creat_day 7	s.Creat_day 10	s.Creat_day 14	s.Creat_day 21
CRRT	8.8	7.22	6.18	5.06	4.25	3.35	2.14
SLED	9.08	7.37	6.42	5.43	4.37	2.95	1.83
PD	8.67	7.28	6.07	5.45	4.3	3.64	2.43

Figure 24: Change in serum creatinine levels (mg/dL)

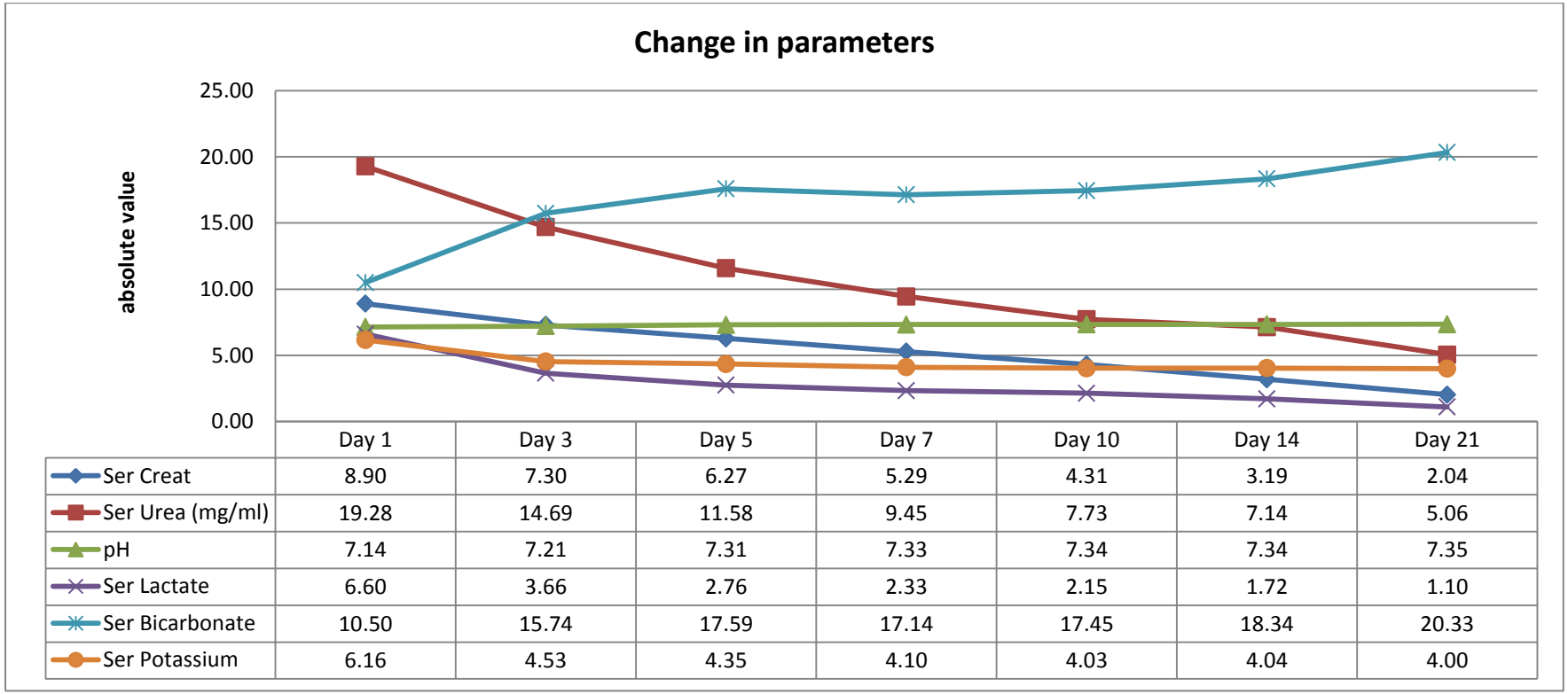
Table 30: Change in Serum urea levels (mg/dL)											
	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
s.Urea_day 1	198.03	39.97	187.90	37.07	195.68	45.23	1.780	0.171	0.067	0.756	0.30
s.Urea_day 3	91.09	22.14	86.95	18.33	91.79	21.70	1.368	0.257	0.148	0.858	0.21
s.Urea_day 5	104.52	24.95	99.20	26.27	108.37	22.69	2.253	0.107	0.131	0.424	0.06
s.Urea_day 7	93.03	23.82	94.79	25.37	97.96	21.33	0.449	0.639	0.621	0.352	0.541
s.Urea_day 10	79.02	23.85	75.07	21.37	80.78	17.61	1.033	0.358	0.234	0.736	0.265
s.Urea_day 14	81.54	99.80	62.23	18.22	74.94	23.68	1.411	0.247	0.099	0.713	0.471
s.Urea_day 21	52.71	15.60	47.94	13.65	53.36	12.90	1.627	0.201	0.107	0.884	0.214



	s.Urea_day 1	s.Urea_day 3	s.Urea_day 5	s.Urea_day 7	s.Urea_day 10	s.Urea_day 14	s.Urea_day 21
CRRT	198.03	91.09	104.52	93.03	79.02	81.54	52.71
SLED	187.9	86.95	99.2	94.79	75.07	62.23	47.94
PD	195.68	91.79	108.37	97.96	80.78	74.94	53.36

Figure 25: Change in Serum urea levels (mg/dL)

The following graph demonstrates the improvement in the mean values of these paramteres over time in the overall patient population of 245 patients, when plotted against time.



	Day 1	Day 3	Day 5	Day 7	Day 10	Day 14	Day 21
Ser Creat	8.90	7.30	6.27	5.29	4.31	3.19	2.04
Ser Urea (mg/ml)	19.28	14.69	11.58	9.45	7.73	7.14	5.06
pH	7.14	7.21	7.31	7.33	7.34	7.34	7.35
Ser Lactate	6.60	3.66	2.76	2.33	2.15	1.72	1.10
Ser Bicarbonate	10.50	15.74	17.59	17.14	17.45	18.34	20.33
Ser Potassium	6.16	4.53	4.35	4.10	4.03	4.04	4.00

Figure 26: Change in parameters

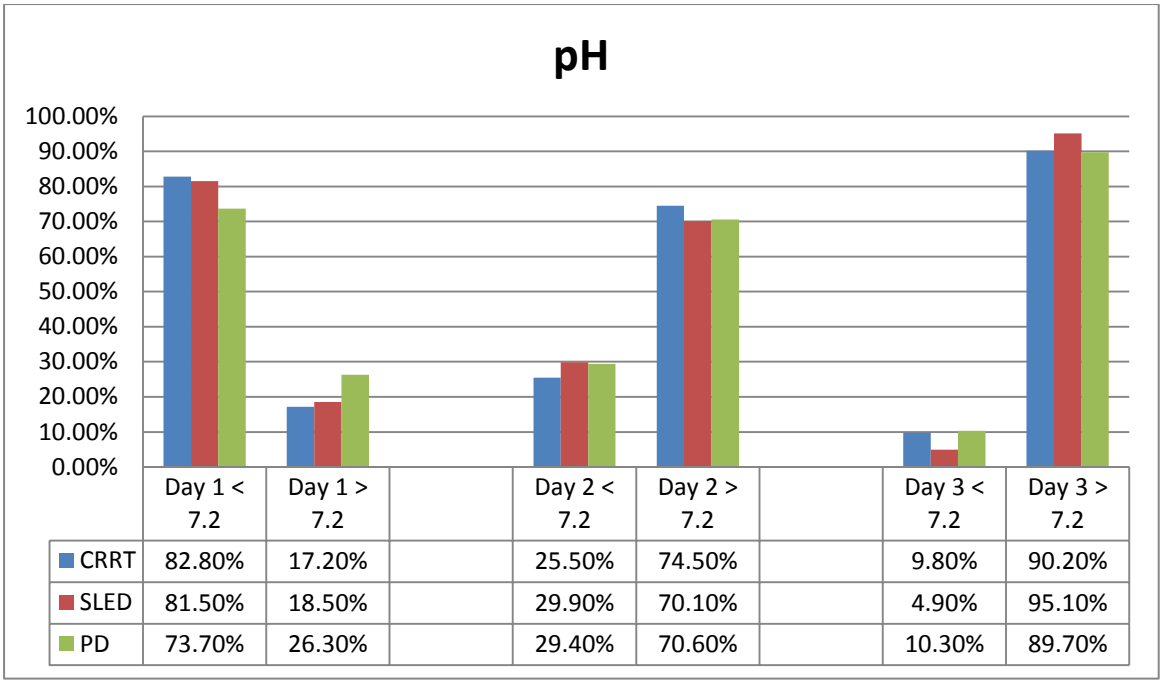
Comparison of groups according to improvement in renal/clinical parameters

Hyperkalemia was considered corrected when serum potassium was less than 5.5 or less and fluid overload was considered corrected when CVP was less than 14cm/h2o and acidosis was considered corrected when pH was more than 7.25 or hco3 was more than 15. As we had collected lab values on alternate days, using the values measured on day 1, 3 and 5 we tabulated patients based on whether their pH was below or above 7.2, serum HCO_3 levels above or below 15, serum potassium level above or below 5.5, serum urea levels above 150 and whether corrected by more than 50% and CVP levels below or above 14 cm H_2O to show correction in clinical parameters.

On day one 198 of 245 (80.8%) patients had severe acidosis with pH <7.2, while only 47 had a pH of greater than 7.2. The percentage of patients with pH <7.2 was 82.8% in CRRT, 81.5% in SLED and 73.7% in PD, the differences were non-significant. At day 5, only 17 patients of 224 (7.6%) had a pH below 7.2 and the distribution of such acidotic patients was comparable between all three groups; 9.8% in CRRT, 4.9% in SLED and 10.3% in PD.

Table 31: improvement in acidosis

		Group						Total	chi-square value	p-value
		CRRT		SLED		PD				
Ph 1st day	> 7.2	17	17.2%	20	18.5%	10	26.3%	47	1.536	0.46
	< 7.2	82	82.8%	88	81.5%	28	73.7%	198		
Total		99	100.0%	108	100.0%	38	100.0%	245		
Ph 3rd day	> 7.2	70	74.5%	75	70.1%	24	70.6%	169	0.509	0.78
	< 7.2	24	25.5%	32	29.9%	10	29.4%	66		
Total		94	100.0%	107	100.0%	34	100.0%	235		
Ph 5th day	> 7.2	83	90.2%	98	95.1%	26	89.7%	207	2.044	0.360
	< 7.2	9	9.8%	5	4.9%	3	10.3%	17		
Total		92	100.0%	103	100.0%	29	100.0%	224		



	Day 1 < 7.2	Day 1 > 7.2		Day 2 < 7.2	Day 2 > 7.2		Day 3 < 7.2	Day 3 > 7.2
CRRT	82.80%	17.20%		25.50%	74.50%		9.80%	90.20%
SLED	81.50%	18.50%		29.90%	70.10%		4.90%	95.10%
PD	73.70%	26.30%		29.40%	70.60%		10.30%	89.70%

Figure 27: Improvement in acidosis (Group wise)

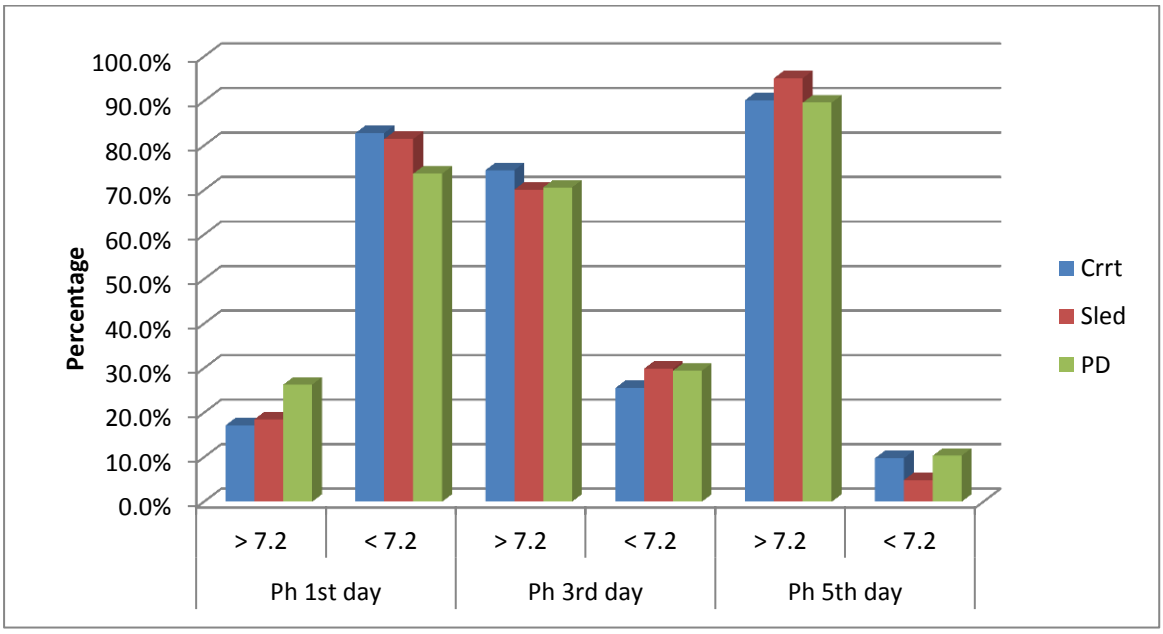


Figure 28: Improvement in acidosis

Similarly, on day one 238 out of 245 (97.1%) patients had serum bicarbonate levels below 15 mmol/L while on day 5, only 48 out of 224 patients (21.4%) persisted with that level of serum bicarbonate with no significant difference on day 1, day 3 and day 5 between groups.

Table 32: Improvement in serum bicarbonate

		Group						Total	chi-square value	p-value
		CRRT		SLED		PD				
S HCO3 1st day	> 15	3	3.0%	3	2.8%	2	5.3%	8	0.579	0.75
	< 15	96	97.0%	105	97.2%	36	94.7%	237		
Total		99	100.0%	108	100.0%	38	100.0%	245		
S HCO3 3rd day	> 15	57	60.6%	73	68.2%	16	47.1%	146	5.06	0.080
	< 15	37	39.4%	34	31.8%	18	52.9%	89		
Total		94	100.0%	107	100.0%	34	100.0%	235		
S HCO3 5th day	> 15	69	75.0%	87	84.5%	20	69.0%	176	4.412	0.110
	< 15	23	25.0%	16	15.5%	9	31.0%	48		
Total		92	100.0%	103	100.0%	29	100.0%	224		

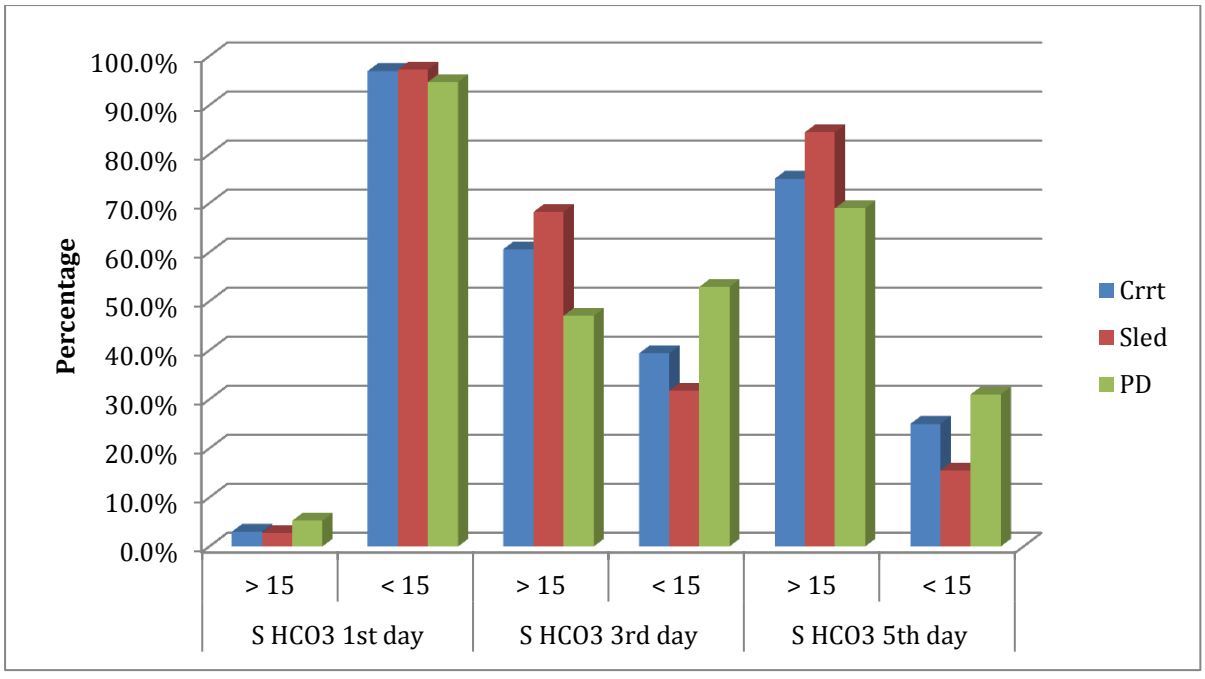


Figure 29: Improvement in serum bicarbonate (group wise)

Serum urea concentration of more than 150 was used as a point of demarcation for patients with severe azotemia and uremia was considered corrected when urea was reduced by more than 50% of its initial value. On day one, 217 out of 245 patients (88.5%) had urea level more than 150, while only 28 of 245 (11.5%) had levels below that mark, and the distribution of such patients was comparable among all three groups. In CRRT group 89.9% had serum urea level more than 150, while in SLED and PD the proportion of such patients was 88.0% and 86.8%, respectively.

As the table 31 demonstrates, the urea reduction by more than 50% was observed in 70.5% on 3rd day and there was little intergroup variability between CRRT, SLED and PD groups. Urea reduction ratio (table 34) also did not show significant intergroup difference.

Table 33: Improvement in Serum Urea

		Group						Total	chi-square value	p-value
			Crrt		Sled		PD			
s.Urea 1st day	< 150	10	10.1%	13	12.0%	5	13.2%	28	0.324	0.850
	> 150	89	89.9%	95	88.0%	33	86.8%	217		
Total		99	100.0%	108	100.0%	38	100.0%	245		
Urea Reduction (3rd day)	< 50%	25	28.1%	28	29.5%	11	33.3%	64	0.318	0.853
	> 50%	64	71.9%	67	70.5%	22	66.7%	153		
Total		89	100.0%	95	100.0%	33	100.0%	217		

Table 34: Urea Reduction Ratio

	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
Urea Reduction	53.97	6.63	53.50	6.10	52.97	5.81	0.379	0.685	0.590	0.404	0.654

Serum potassium level of less than 5.5 mmol/L was considered as the cut-off point for correction of hyperkalemia. On day one, majority of the

patients (216 of 245, 88.2%) had serum potassium more than 5.5 and the distribution of such patients was not significantly different between the groups. On day 5, only 8 out of 224 patients (3.6%) persisted with serum K levels more than 5.5 mmol/L and the percentage of such patients was similar in all the study groups, suggesting that all the three modalities were equally effective in correcting hyperkalemia.

Table 35: Improvement in hyperkalemia

		Group						Total	chi-square value	p-value
		CRRT		SLED		PD				
S.K 1st day	< 5.5	17	17.2%	7	6.5%	5	13.2%	29	5.732	0.06
	> 5.5	82	82.8%	101	93.5%	33	86.8%	216		
Total		99	100.0%	108	100.0%	38	100.0%	245		
S.K 3rd day	< 5.5	92	97.9%	97	90.7%	31	91.2%	220	4.759	0.09
	> 5.5	2	2.1%	10	9.3%	3	8.8%	15		
Total		94	100.0%	107	100.0%	34	100.0%	235		
S.K 5th day	< 5.5	90	97.8%	98	95.1%	28	96.6%	216	1.015	0.6
	> 5.5	2	2.2%	5	4.9%	1	3.4%	8		
Total		92	100.0%	103	100.0%	29	100.0%	224		

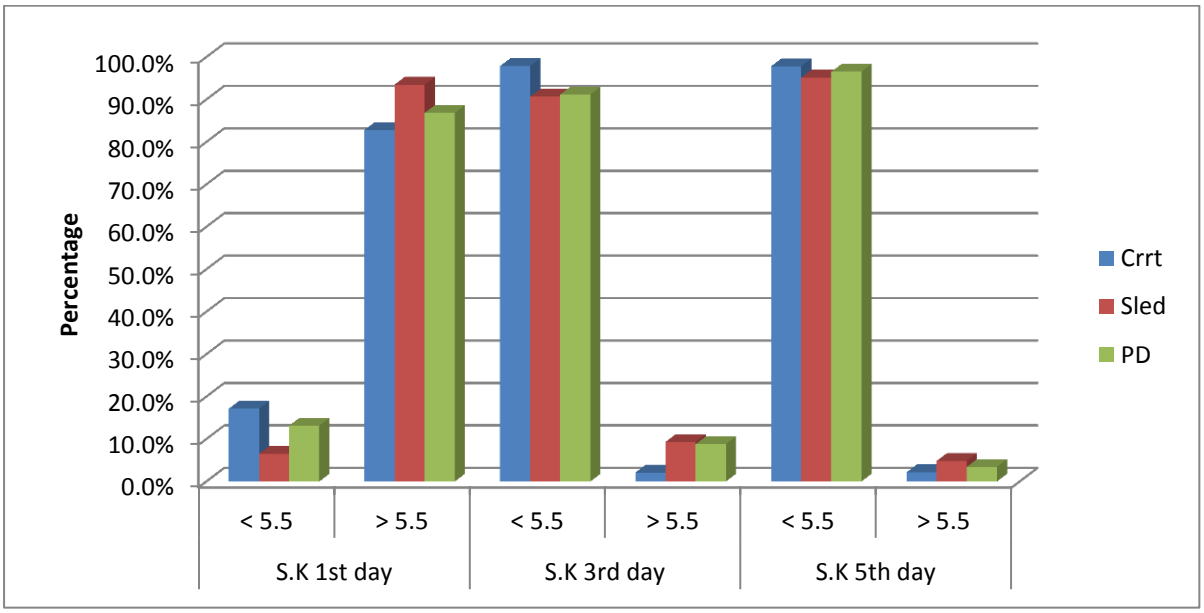


Figure 30: Improvement in hyperkalemia

A similar nonsignificant difference in baseline CVP was observed on day 1, in all the three groups. However, one important finding was that

at day 3, while the percentage of patients with CVP >14 cm H2O in CRRT and PD reduced from 28.3% and 34.2% to 1.1% and 0%, respectively, in SLED group the reduction was from 29.6% to 11.2% only, leaving a significant proportion of patients with CVP >14 in SLED group. This difference was statistically significant with p-value of 0. But on day 5, no such difference was observed as all three groups show effective reduction in number of patients with CVP more than 14. Compared to CRRT and PD (continuous modalities with long treatment sessions), SLED (shorter treatment session of 4-6 hrs each day) was slow in correcting the fluid overload, but that it catches up with the other two modalities by day 5 in reducing CVP.

Table 36: Improvement in CVP

		Group						Total	chi-square value	p-value
		CRRT		SLED		PD				
CVP 1st day	< 14	71	71.7%	76	70.4%	25	65.8%	172	0.464	0.79
	> 14	28	28.3%	32	29.6%	13	34.2%	73		
Total		99	100.0%	108	100.0%	38	100.0%	245		
CVP 3rd day	< 14	93	98.9%	95	88.8%	34	100.0%	222	12.195	0
	> 14	1	1.1%	12	11.2%	0	0.0%	13		
Total		94	100.0%	107	100.0%	34	100.0%	235		
CVP 5th day	< 14	92	100.0%	102	99.0%	29	100.0%	223	1.18	0.55
	> 14	0	0.0%	1	1.0%	0	0.0%	1		
Total		92	100.0%	103	100.0%	29	100.0%	224		

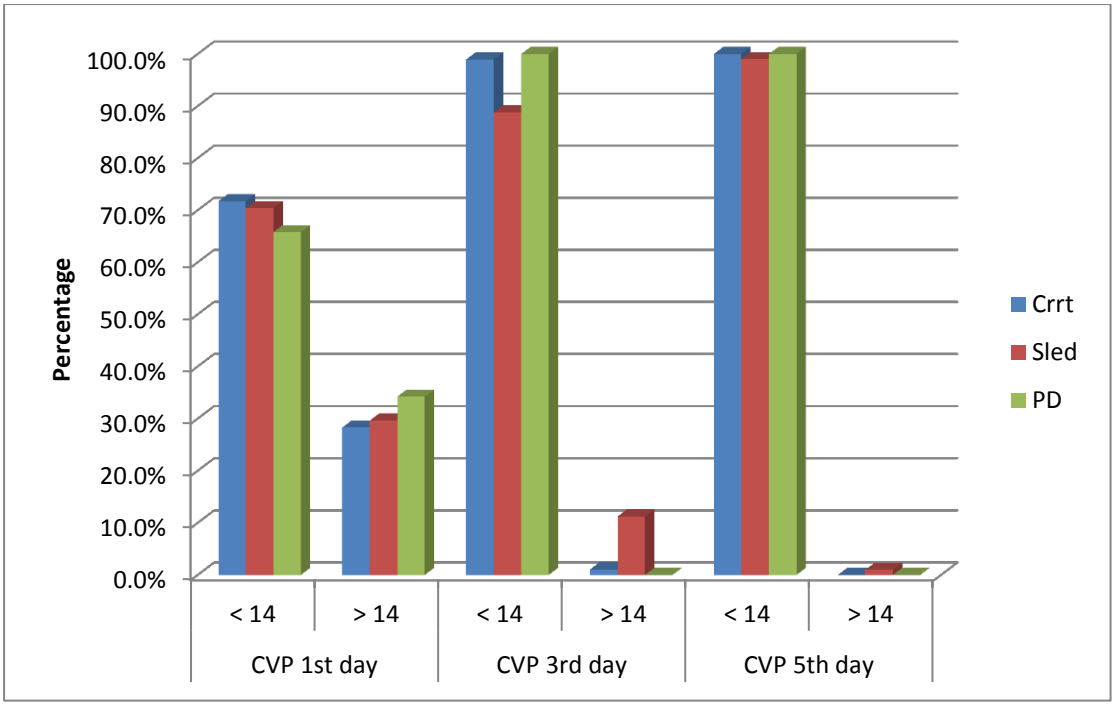


Figure 31: Improvement in CVP

Primary outcome

Survival at day 14 after RRT:

As an outcome measure we tabulated the survival in each group after 14 days of RRT and found that the overall 14 day post-RRT survival was 42% and the group wise survival was similar, 40.4% in CRRT, 45.4% in SLED and 36.8% in PD, and the difference had no significance on statistical analysis.

Table 37: Survival at 14 days after RRT

		Group						Total	chi-square value	p-value
		CRRT (n=99)		SLED (n=108)		PD(n=38)				
Survival at 14 days after RRT	Present	40	40.4%	49	45.4%	14	36.8%	103	1.022	0.600
	Absent	59	59.6%	59	54.6%	24	63.2%	142		

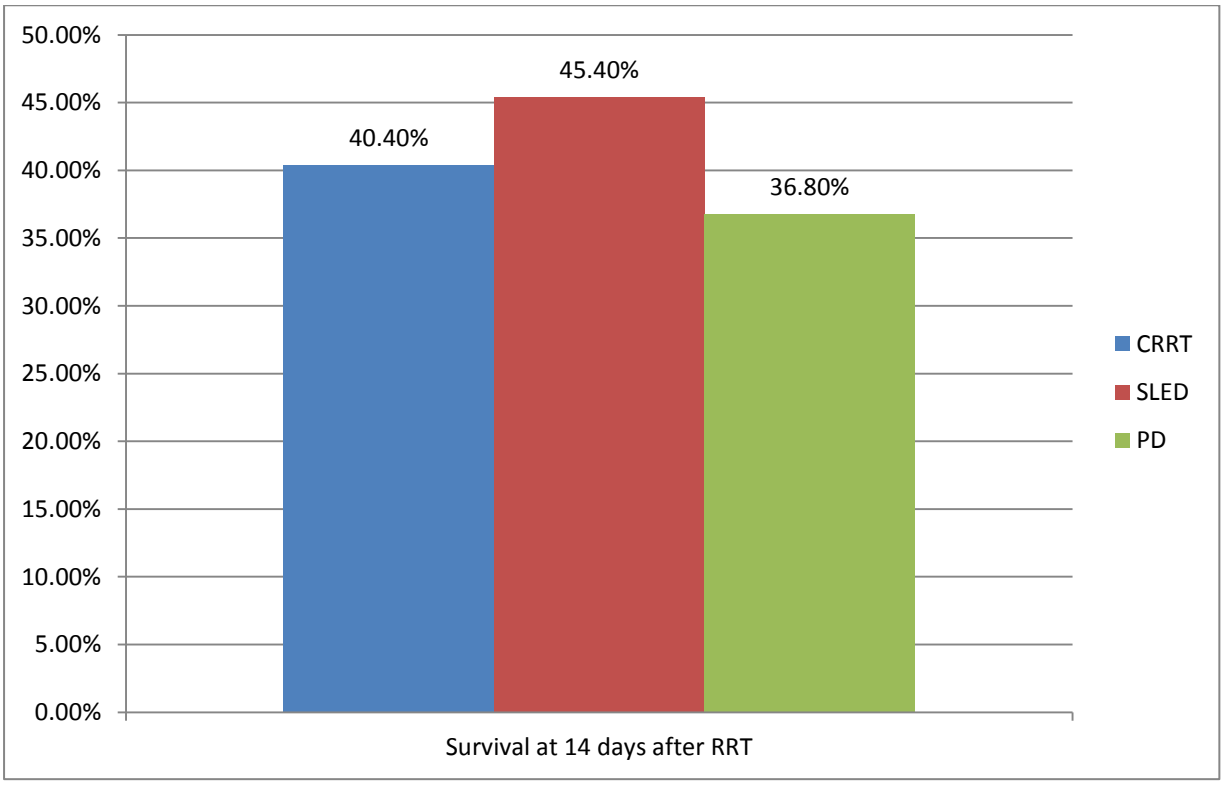


Figure 32: Survival at 14 days after RRT

Secondary outcomes

The following table depicts the 14 day mortality (14th day after admission), 14 day post-RRT mortality (14 days after stopping RRT), and 30 day mortality of all three groups. The overall 14 day morality was 40.5%, while the 14 day post-RRT mortality was 58.7%. The outcome measure of 30 day mortality was 59% overall; though it varied between groups (CCRT 60.6%, SLED 55.6% and PD 65.8%), the difference was not significant.

Table 38: Secondary Outcomes

		Group						Total	chi-square value	p-value
		CRRT (n=99)		SLED (n=108)		PD(n=38)				
14 day mortality rate	Present	41	41.4%	38	35.2%	20	52.6%	99	3.456	0.178
	Absent	58	58.6%	69	63.9%	18	47.4%	145		
Mortality at 14 days after RRT	Present	59	59.6%	60	55.6%	25	65.8%	144	1.261	0.532
	Absent	40	40.4%	48	44.4%	13	34.2%	101		
30 day mortality rate	Present	60	60.6%	60	55.6%	25	65.8%	145	1.358	0.507
	Absent	39	39.4%	48	44.4%	13	34.2%	100		

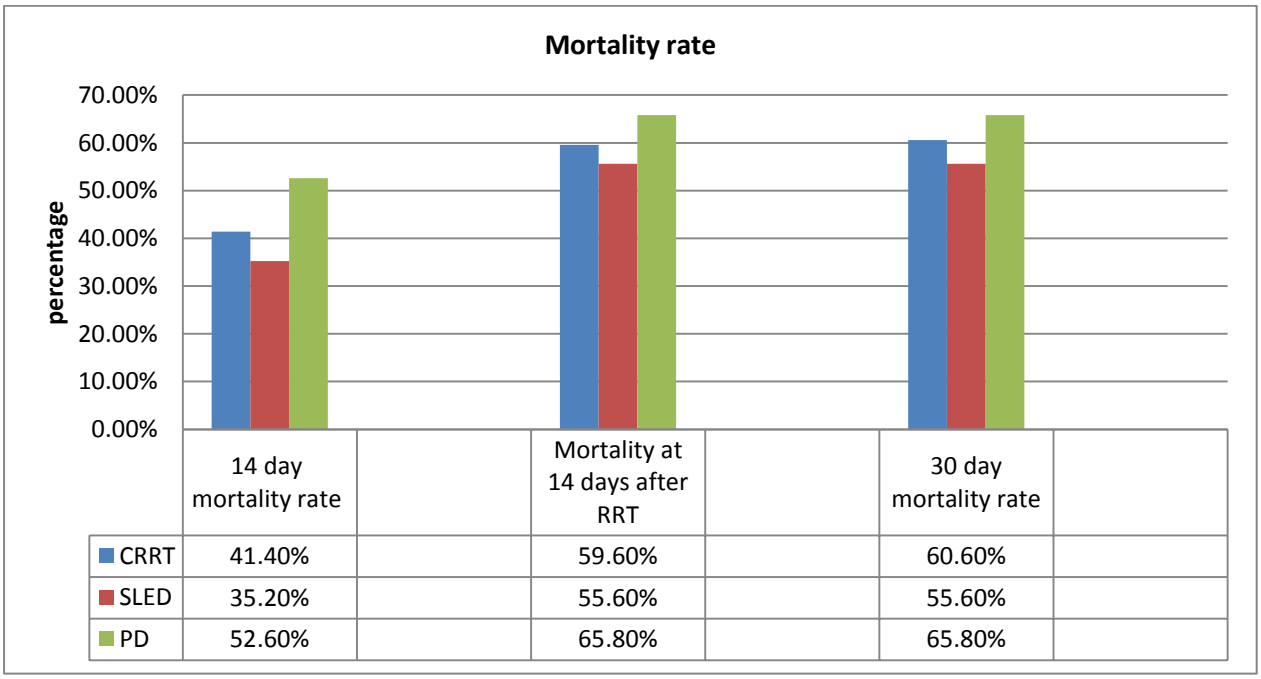


Figure 33: Mortality rate

The overall hospital based mortality from all the causes was 59.4%, while this number was slightly different in the three groups: 60.6% in CRRT, 55.6% in SLED and 65.8% in PD.

Table 39: All cause hospital based mortality

		Group						Total	chi-square value	p-value
		1 (n=99)		2 (n=108)		3 (n=38)				
All cause intra hospital mortality rate (last contact)	Present	60	60.6%	60	55.6%	25	65.8%	145	1.358	0.507
	Absent	38	38.4%	48	44.4%	13	34.2%	99		

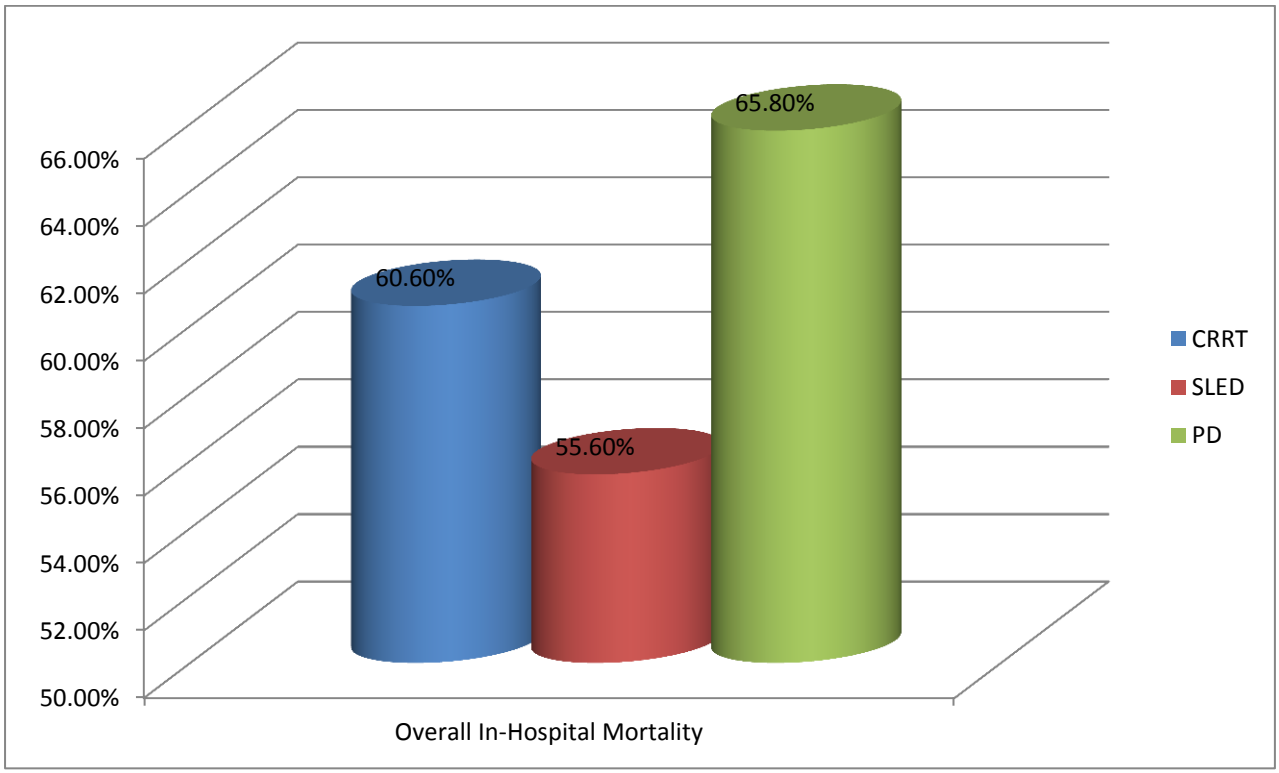


Figure 34: All cause hospital based mortality

Average days until death in our study population was 11.7 days. The group-specific mean time to death was 11.97 days in CRRT and 12.82 in SLED, while it was only 7.68 days in the PD group, significantly less in comparison to CRRT or SLED group.

The mean hospital stay in our study was 18.8 days, which was slightly different among the three groups, 19.50 days in CRRT, 18.88 in SLED and 17.27 days in PD. Our patients spent an average of 3.66 days on RRT with slight variation between the groups, and were free from dialysis for an average of 11.72 days. There was no significant difference among the three groups in terms of days until discharge, days spent on RRT and days free from dialysis.

Table 40: Days until death/discharge, days on RRT/dialysis free days

	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
Days until death	11.97	6.60	12.82	5.19	7.68	5.55	6.983	0.001	0.430	0.003	0.000
Days until discharge	19.50	3.90	18.88	4.00	17.27	4.83	1.627	0.202	0.477	0.074	0.187
Days on RRT (duration of RRT)	3.66	1.87	3.83	1.57	3.18	1.67	2.011	0.136	0.460	0.151	0.046
Dailysis free days	12.26	6.26	10.79	4.60	12.93	3.90	2.455	0.088	0.049	0.652	0.148

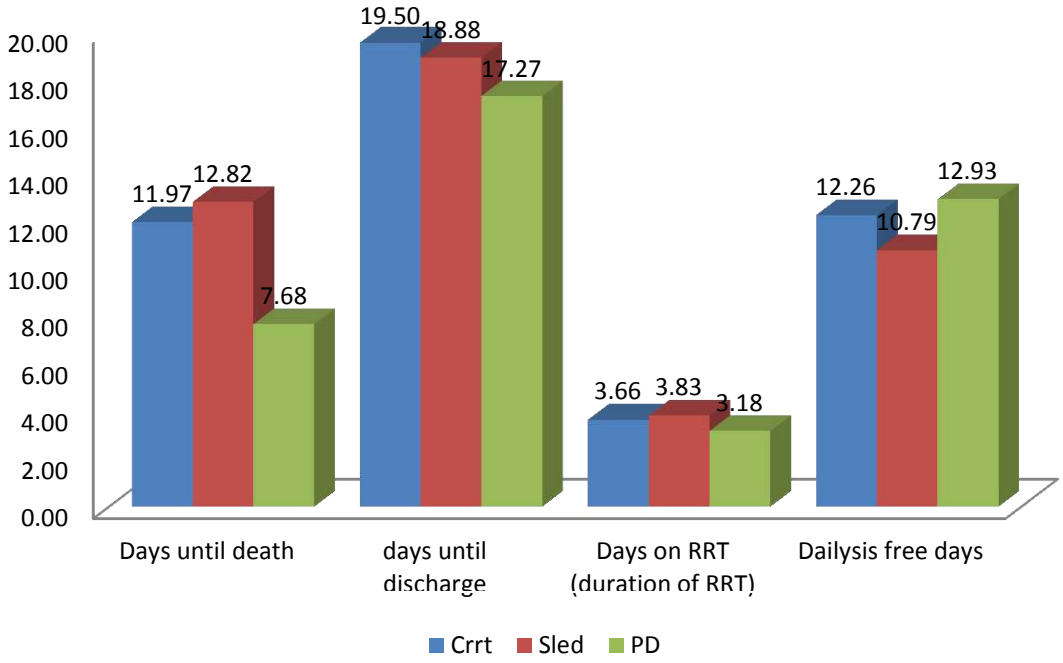


Figure 35: Days until death/discharge, days on RRT/dialysis free days

The mean serum creatinine level at discharge or last contact in survivors was 1.99 mg/dL. The modality specific serum creatinine at discharge was 2.12, 1.94 and 1.78 in CRRT, SLED and PD groups respectively.

Table 41: Serum Creatinine at discharge

	CRRT		Sled		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
Serum creat at discharge/ last contact in survivors; mg/dl)	2.12	1.55	1.94	1.37	1.78	1.16	0.342	0.711	0.561	0.447	0.710
Total UF (ML)	8473.74	2839.86	8961.11	2684.98	8260.53	2972.54	1.236	0.292	0.211	0.690	0.185

Mean ultra filtrate was 8473.7 ml in CRRT group, 8961.1 ml in SLED and 8260.5 in PD group. There was no significant intergroup variation between the three groups.

RRT dependence

Out of a total of 103 patients, 21 (20.3%) were dependent on RRT at 30 days of admission. A similar percentage of patients in CRRT, SLED and PD were dependent on RRT at 30 days, 22.5%, 18.4% and 21.4%, respectively.

Table 42: 30 day RRT dependence

		Group						Total	chi-square value	p-value
		CRRT (n=40)		Sled (n=49)		PD(n=14)				
30 day RRT dependence	Yes	9	22.5%	9	18.4%	3	21.4%	21	0.243	0.886
	No	31	77.5%	49	100.0%	11	78.6%	82		

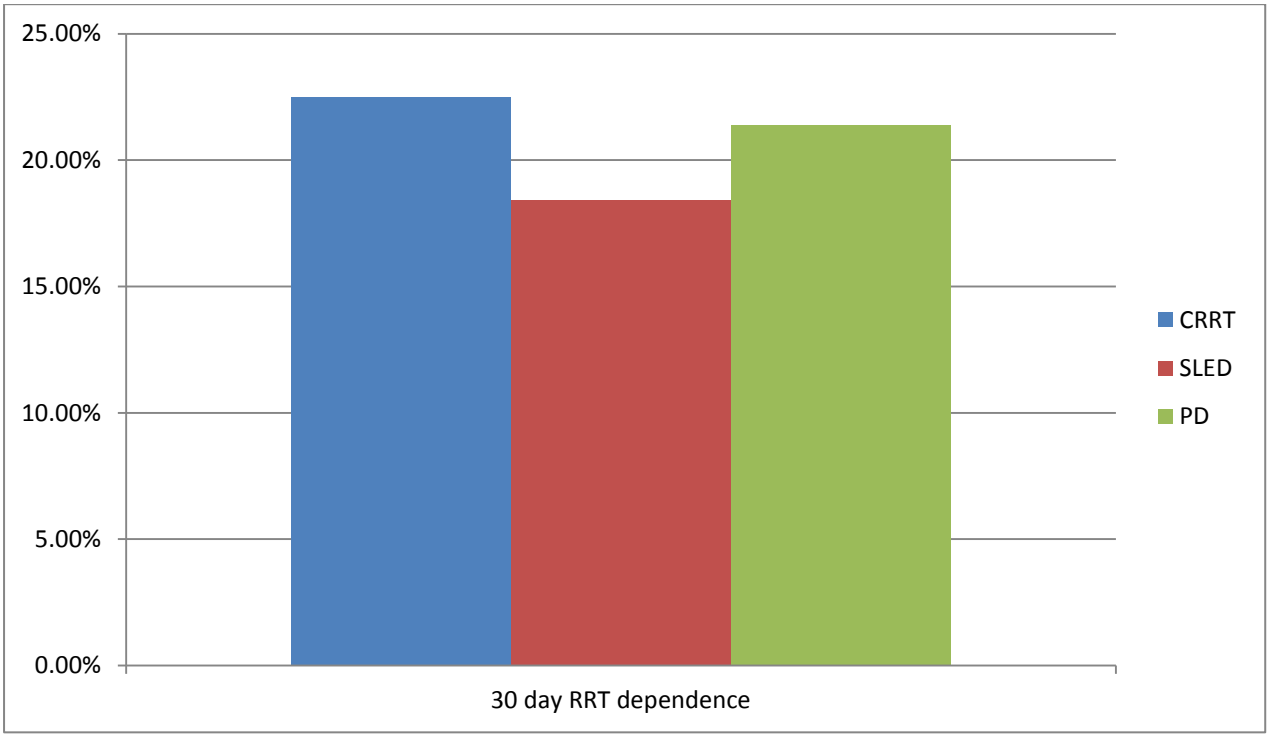


Figure 36: 30 day RRT dependence

Out of the total of 245 patients who were started on a modality of RRT, 78 needed to shift to a different modality of RRT during the course of treatment. Out of 33 patients in CRRT group requiring shift, 19 were shifted to SLED and 14 to PD. In the SLED group 31 were shifted, 21 to CRRT and 10 to PD, while as 14 patients in PD were shifted, 9 to SLED and 5 to CRRT.

Table 43: RRT switch

		Group						Total	chi-square value	p-value
		CRRT (n=99)		SLED (n=108)		PD(n=38)				
RRT switch	Yes	33	33.3%	31	28.7%	14	36.8%	78	1.029	0.598
	No	66	66.7%	77	71.3%	24	63.2%	167		
Switch to	CRRT	0	0.0%	21	19.4%	5	13.2%	25	45.311	0.000
	SLED	19	19.2%	0	0.0%	9	23.7%	28		
	PD	14	14.1%	10	9.3%	0	0.0%	24		

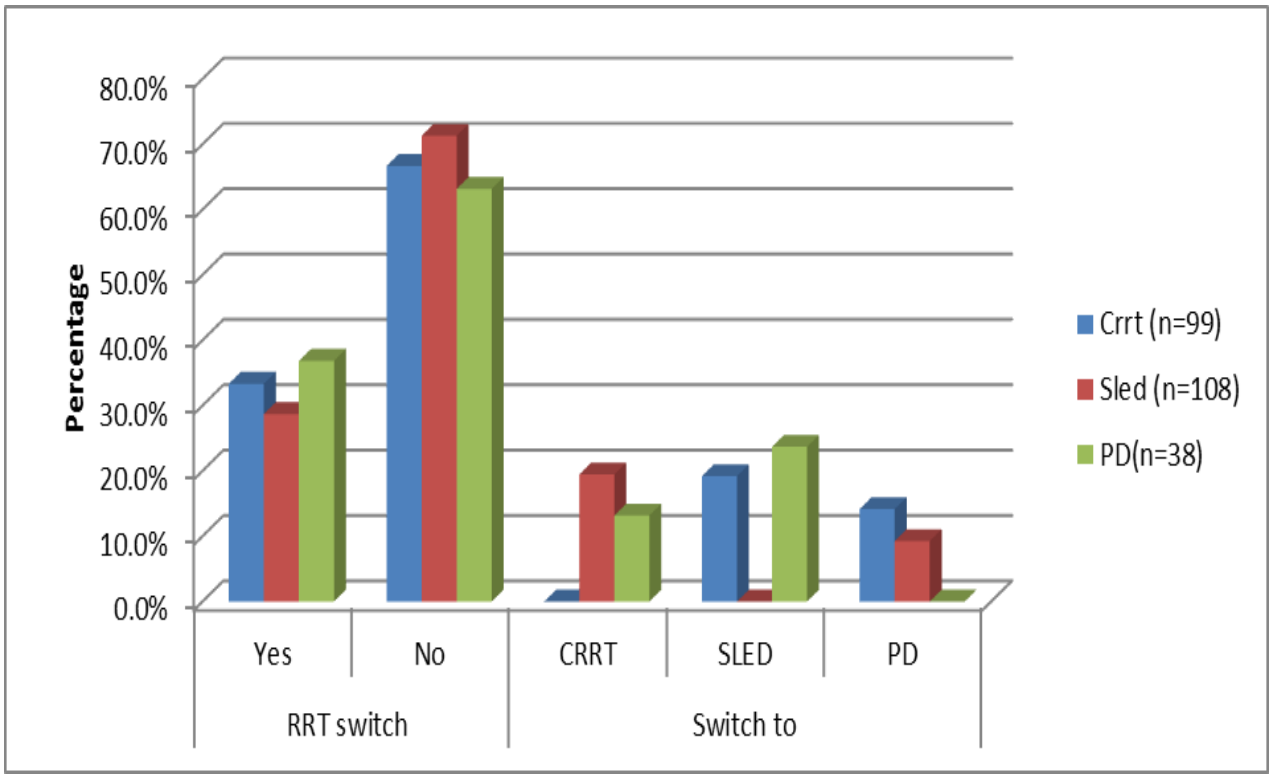


Figure 37: RRT switch

Anticoagulation

No anti-coagulation was used in 137 study patients. None of the patients in PD group and only 8.3% in SLED group received anticoagulation. Heparin was used in 33.3% and 8.3 % of CRRT and SLED patients, respectively while as citrate was used only in the CRRT group in 58.6% patients.

Table 44: Use of anticoagulation

		Group						Total	chi-square value	p-value
		CRRT (n=99)		SLED (n=108)		PD(n=38)				
Anticoagulation use	Nil	8	8.1%	99	91.7%	38	100.0%	137	217.12	0.000
	Heparin	33	33.3%	9	8.3%	0	0.0%	42		
	Citrate	58	58.6%	0	0.0%	0	0.0%	58		
Total		99	100.0%	108	100.0%	38	100.0%	245		

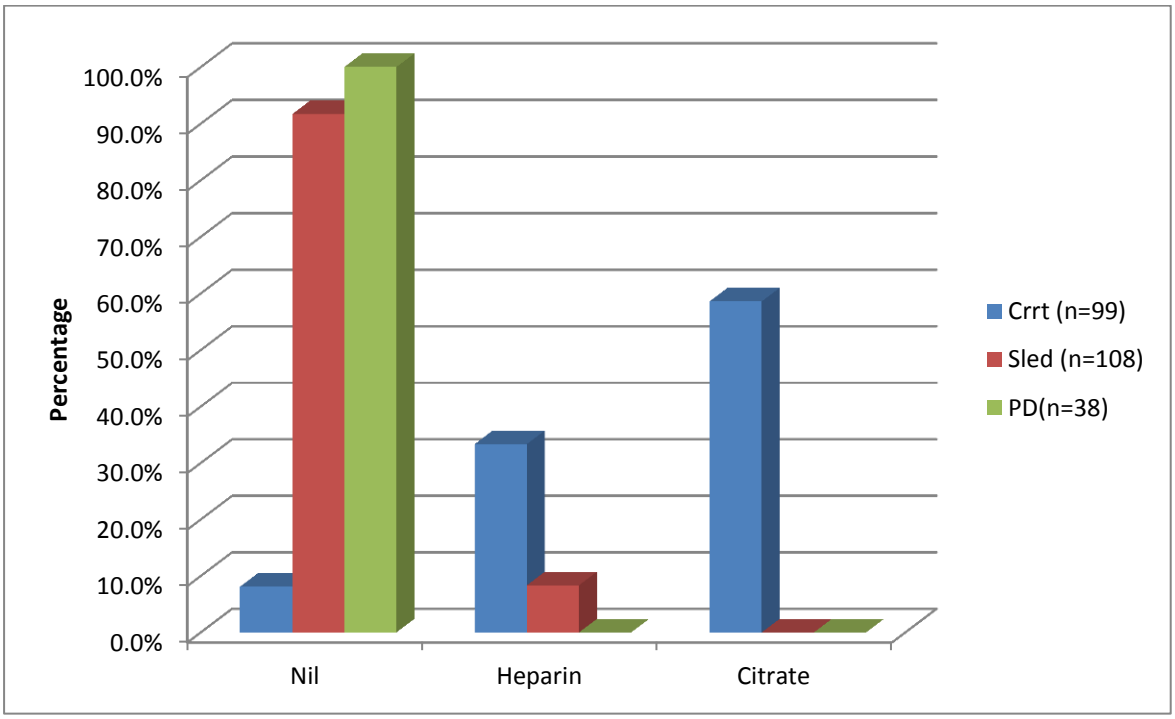


Figure 38: Use of anticoagulation

Use of mechanical ventilation

Our patients overall required an average 7.30 days of mechanical ventilation, varying very little between the three groups; CRRT 7.39 days, SLED 7.06 days and PD 7.61 days.

Table 45: Use of mechanical ventilation

	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
Total days on mechanical ventilation	7.39	2.29	7.06	1.83	7.61	2.06	0.676	0.510	0.383	0.672	0.292

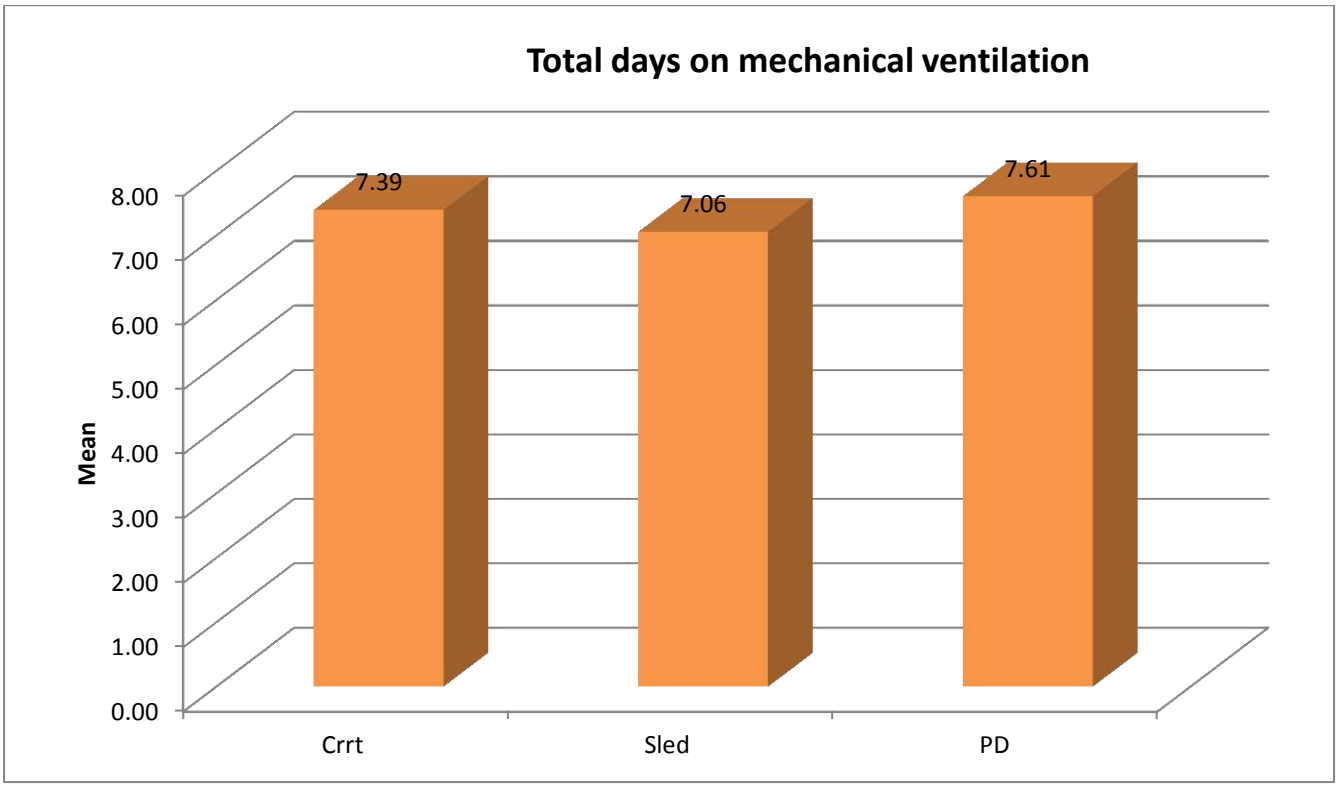


Figure 39: Total days on mechanical ventilation

Vasopressors in different groups

All our patients required vasopressor support (overall mean 7.72 days) but the average number of days on vasopressor was slightly different between groups; 7.55 days in CRRT, 7.98 in SLED and 7.42 in PD group.

The cumulative dose of nor-epinephrine used was 559.2 mcg/min in CRRT, 553.52 in SLED and 577.89 in PD group. In those patients requiring vasopressin, the cumulative dose in units was 274.33, 240.67 and 317.24 in CRRT, SLED and PD respectively. And the cumulative dose of dobutamine (in grams) was 5.09, 3.83 and 4.88 in CRRT, SLED and PD groups, respectively.

Table 46: Dose of vasopressor agents											
	CRRT		SLED		PD		F	p-value	CRRT vs SLED	CRRT vs PD	SLED vs PD
	Mean	SD	Mean	SD	Mean	SD			p-value	p-value	p-value
Total days on vasopressors	7.55	3.30	7.98	3.43	7.42	3.87	0.581	0.560	0.364	0.850	0.389
Norepinephrine (cumulative dose in mcg/min)	559.19	164.21	553.52	136.64	577.89	132.91	0.382	0.683	0.783	0.508	0.383
Vasopressin (cumulative dose in units)	274.33	99.29	240.67	48.32	317.24	61.27	3.909	0.024	0.180	0.055	0.008
Dobutamine (cumulative dose in grams)	5.09	1.78	3.83	1.37	4.88	1.08	3.364	0.043	0.014	0.682	0.075

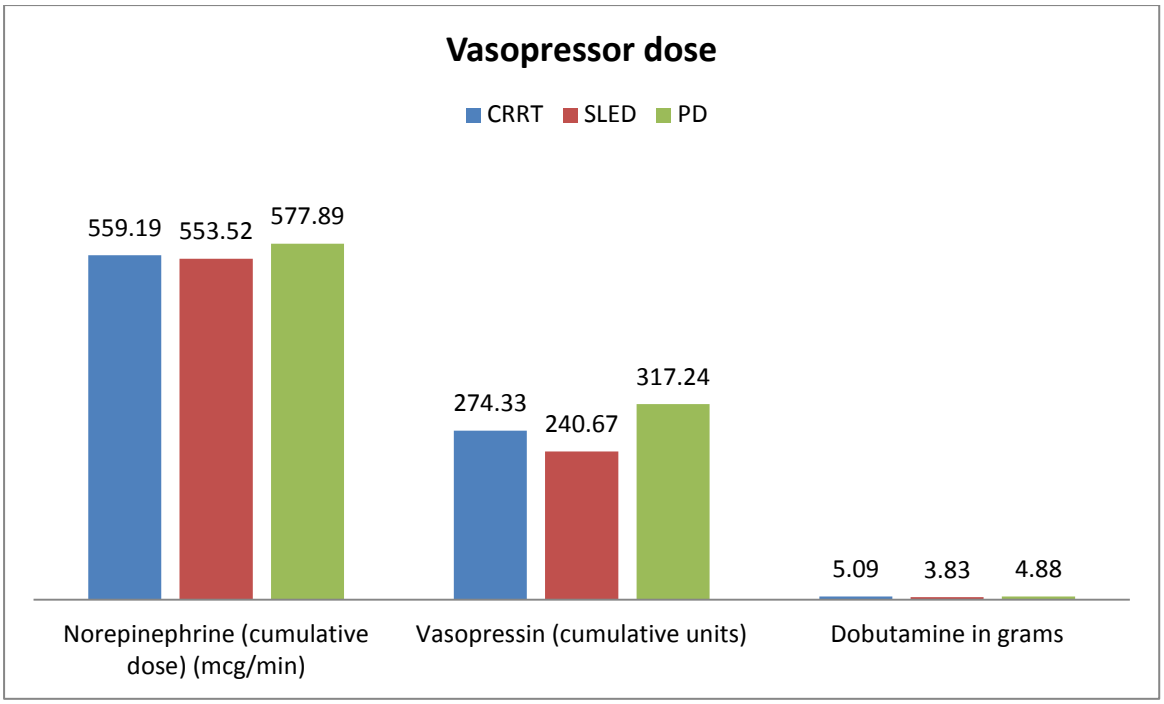


Figure 40: Dose of vasopressor agents

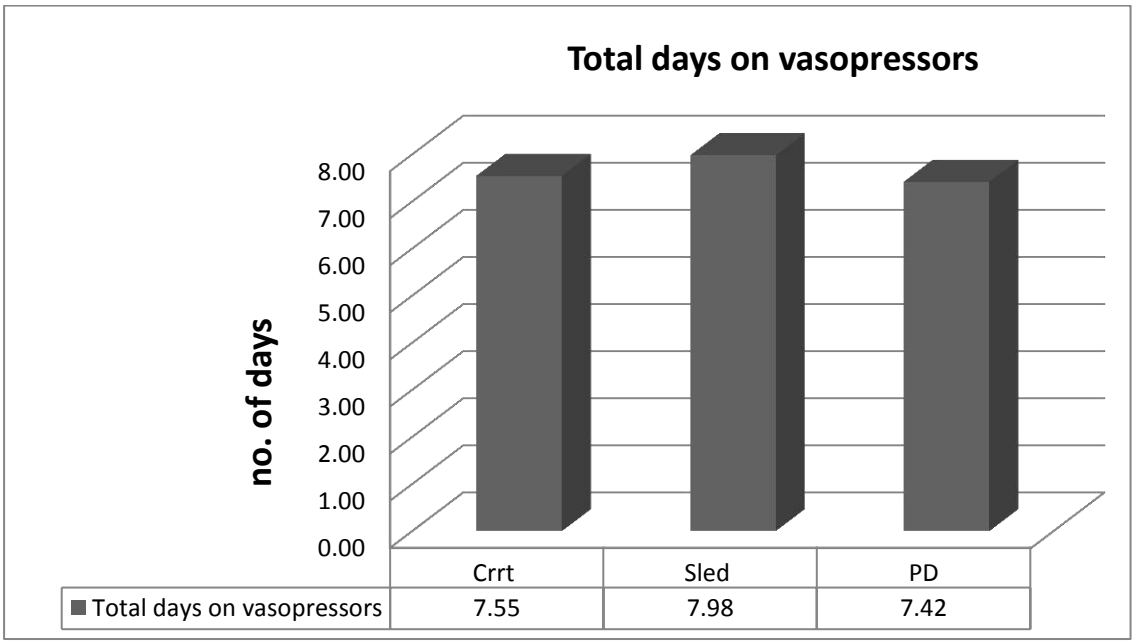


Figure 41: Total days on vasopressors

We analysed the data from all the patients and tabulated the demographic, metabolic, hemodynamic, haematological and biochemical parameters, and etiological factors, comorbid conditions etc according to the survival or mortality of the patients. The data is given in the two tables 47 and 48.

Comparison of groups according to outcome (demographic/ clinical parameters)

In terms of age, older age was a strong predictor of mortality as the patients who survived were nearly 8 years younger than those that did not survive (64.59 years in survival group vs 56.91 years in mortality group). Gender had no effect no survival.

Among the patients with medical causes of AKI mortality was significantly higher than those with AKI secondary to surgical causes possibly because of very less number of patients in surgical group compared to medical group.

Among all the comorbidities noted, the patients with diabetes mellitus (DM), coronary artery disease (CAD), chronic heart failure (CHF) and chronic kidney disease (CKD) were much more likely to die than those who did not have these three comorbidities. Presence of other comorbid conditions (eg hypertension, COPD, stroke, malignancy, pancreatitis) did not affect mortality significantly.

Table 47: Comparison between survival and mortality group								
14 day mortality rate after RRT	Died		Alive		t/Z	p-value		
	Mean	SD	Mean	SD				
Age	64.59	8.78	56.91	7.56	7.127	0.000		
						Total	chi-square value	p-value
		Died		Alive				
Gender	Male	84	58.3%	55	54.5%	139	0.364	0.546
	female	60	41.7%	46	45.5%	106		
Reason for AKI	sepsis	106	73.6%	79	78.2%	185	1.359	0.507
	cardiac	34	23.6%	18	17.8%	52		
	haemorrhagic	4	2.8%	4	4.0%	8		
Major Category	medical	137	95.1%	96	95.0%	233	0.001	0.975
	surgical	7	4.9%	5	5.0%	12		
DM	Yes	80	55.6%	40	39.6%	120	6.045	0.014
	No	64	44.4%	61	60.4%	125		
HTN	Yes	74	51.4%	42	41.6%	116	2.289	0.130
	No	70	48.6%	59	58.4%	129		
COPD	Yes	25	17.4%	16	15.8%	41	0.098	0.754
	No	119	82.6%	85	84.2%	204		
CAD	Yes	62	43.1%	24	23.8%	86	9.700	0.002
	No	82	56.9%	77	76.2%	159		
CKD	Yes	81	56.3%	21	20.8%	102	30.714	0.000
	No	63	43.8%	80	79.2%	143		
CHF	Yes	23	16.0%	6	5.9%	29	5.725	0.017
	No	121	84.0%	95	94.1%	216		
Neurology/ post stroke	Yes	14	9.7%	8	7.9%	22	0.236	0.627
	No	130	90.3%	93	92.1%	223		
Malignancy	Yes	10	6.9%	5	5.0%	15	0.411	0.522
	No	134	93.1%	96	95.0%	230		
Pancreatitis	1	18	12.5%	9	8.9%	27	0.780	0.377
	2	126	87.5%	92	91.1%	218		

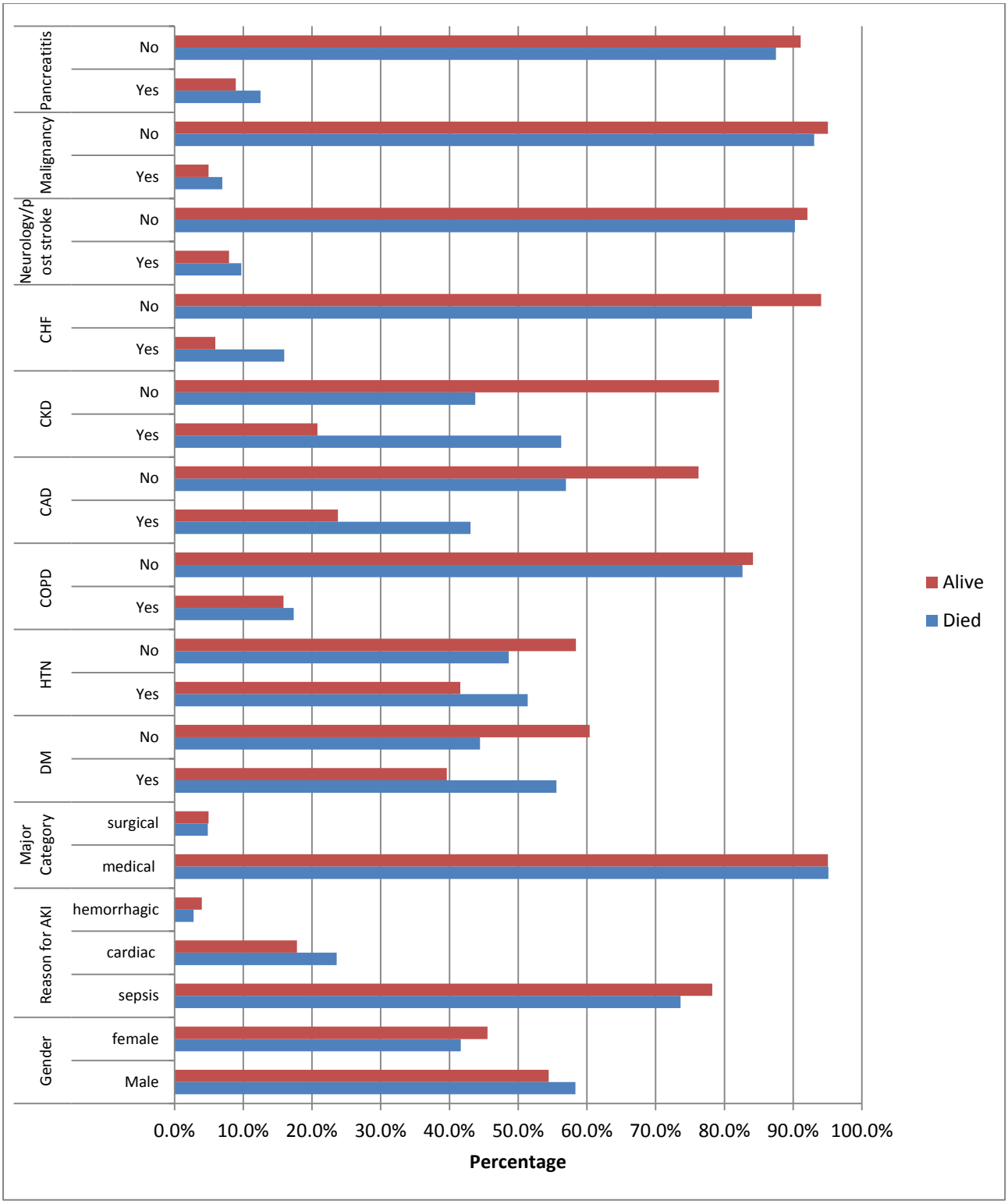


Figure 42: Comparison between survival and mortality group

Comparison of groups according to outcome (disease severity parameters)

Among those who died the mean SOFA score on day 1 was significantly higher than those who survived (15.74 vs 12.81, p-value 0.000). Similarly some of the indicators of circulatory failure differed significantly between the survival and the mortality group. The day one mean SBP (93.39 vs 88.22) and mean MAP (69.84 vs 66.11) were significantly higher in the survival group (p-value <0.005) while as the day one mean CVP (11.58 vs 14.10) and the mean duration of vasopressors (5.81 vs 9.06 days) required was significantly lower.

The need for mechanical ventilation and the total duration on mechanical ventilation also differed significantly between the survival and mortality group. A higher percentage of patients who required mechanical ventilation died, and the mean duration of mechanical ventilations was longer in the mortality group (7.68 days in mortality group vs 6.59 in survival group, p=0.003)

Other factors like pre-morbid serum creatinine levels, baseline bicarbonate level, DBP on day one, day 1 pH, serum creatinine, serum urea, serum potassium, and serum lactate levels showed no significant difference between the survival and mortality group.

Table 48: Comparison between survival and mortality group								
14 day mortality rate after RRT	Died		Alive		t/Z	p-value		
	Mean	**SD**	**Mean**	**SD**				
Age	64.59	8.78	56.91	7.56	7.127	0.000		
Hb (g/dl)	10.09	1.15	11.32	10.09	-1.455	0.147		
Premorbid creatinine	2.51	0.83	2.68	0.62	-0.712	0.479		
Hco3 baseline	12.60	2.06	13.15	3.70	-1.471	0.143		
SBP	88.22	3.16	93.39	5.17	-9.683	0.000		
DBP	61.88	2.77	62.07	7.25	-0.282	0.778		
SOFA score day 1	15.74	1.52	12.81	2.30	11.995	0.000		
Total days on mechanical ventilation	7.68	2.23	6.59	1.58	3.031	0.003		
Need for mechanical ventilation	Yes	86	59.7%	43	42.6%	129	7.002	0.009
	No	58	40.3%	58	57.4%	116		
Total days on vasopressors	9.06	3.53	5.81	2.19	8.190	0.000		
Ph day 1	7.14	0.06	7.16	0.05	-2.574	0.011		
s.Creat day 1	8.86	1.62	8.97	1.69	-0.512	0.609		
Lactate day 1	6.85	2.15	6.24	2.05	2.259	0.025		
s.Urea day 1	190.49	32.41	196.08	47.31	-1.097	0.274		
MAP day 1	66.11	6.24	69.84	5.19	-4.933	0.000		
CVP day 1	14.10	1.96	11.58	1.94	9.923	0.000		
S.K day 1	6.18	0.60	6.13	0.69	0.621	0.535		

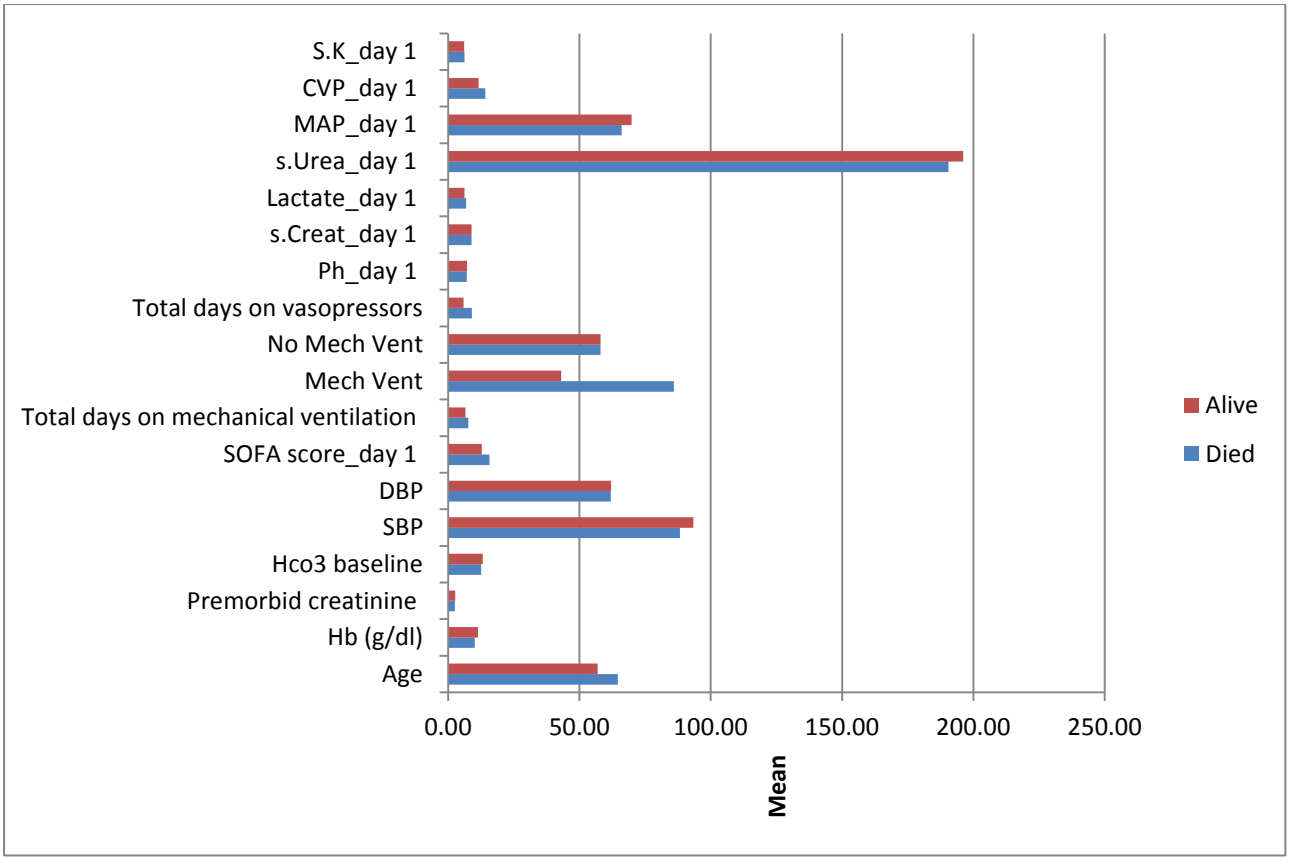


Figure 43: Comparison between survival and mortality group

DISCUSSION

This study was a prospective observational study of 245 critically ill patients with AKI with need of RRT. In critically ill patients with AKI who have hemodynamic instability, one can choose from CRRT, SLED and acute PD as a mode of RRT because of their inherent virtue of hemodynamic tolerability and causing minimal drop in blood pressure. The optimal mode of RRT in critically ill and hemodynamically unstable patients is not known. In this study, we investigated the potential impact of three of the major renal replacement therapies (CRRT, SLED and PD) on mortality and renal related outcome measures. All our patients were admitted in ICU and required vasopressor support in order to maintain hemodynamic stability.

At baseline, no statistically significant differences between the study groups were noted regarding demographics, disease severity, key physiological and hemodynamic indices, renal function, and acid/base balance.

The mean age of study population was 61.42 years and ranged from 45 years to 86 years. The mean age in most other studies is comparable to our results (as shown in table 49). However in some studies, like Kumar et al. (2000) [96], Kumar et al. (2004) [102], and Jaryal et al (2017) [27] the overall mean age of the patients was lower than that in our study.

Table 49: Study and mean age of patients		
Study	**Study Features**	**Mean Age (years)**
Present Study	CRRT vs SLED vs PD	61.42 ± 9.11
Kumar 2000 [96]	SLED vs CVVH/CRRT	50.03±17.4
Marshall 2001 [98]	SLED	58.0
Kumar 2004 [102]	SLED vs CHD	52.0 ± 13.9
Berbece 2006 [103]	SLED	58.4 ± 13.0
Marshall 2010 [108]	CRRT to PIRRT/SLED	64.8±4.8
Fieghen 2010 [30]	IHD vs CRRT vs SLED	63.5 +15.9
George 2011 [28]	CRRT vs PD	46.88±17.48
Schwenger 2012 [109]	SLED vs CVVH/CRRT	66.2 ± 12.4
Schefold 2014 [111]	iHD vs CVVH/CRRT	61.5±13.93
Kitchlu 2015 [29]	CRRT vs SLED	61.6 ±15.9
Jaryal 2017 [27]	CRRT vs PD	53.5±17.6
Sharma 2020 [119]	SLED	57.48 ± 15.67

Sex ratio was in favour of males. The majority of the patients were male (56.7%) while the rest (43.3%) were females. All the studies (table 50) show a similar gender distribution with males being more common than females though the exact percentage varies slightly between various studies.

Table 50: Gender distribution in various studies			
Study	Total (n/100%)	Male (n/%)	Female (n/%)
Present Study	245	139 (56.7%)	106 (43.3%)
Kumar 2000 [96]	42	27 (64.3%)	15 (35.7%)
Marshall 2001 [98]	37	25 (67.6%)	12 (38.4%)
Kumar 2004 [102]	54	34 (63%)	20 (37%)
Berbece 2006 [103]	34	21 (62%)	13 (38%)
Fieghen 2010 [30]	77	53 (69%)	24 (31%)
Marshall 2010 [108]	270	164 (60.7%)	106 (39.3%)
George 2011 [28]	50	31 (62%)	19 (38%)
Schwenger 2012 [109]	232	157 (67.7%)	75 (32.3%)
Schefold 2014 [111]	250	156 (62.4%)	94 (37.6%)
Kitchlu 2015 [29]	242	144 (59.5%)	98 (40.5%)
Jaryal 2017 [27]	40	23 (57.5%)	17 (42.5%)
Sharma 2020 [119]	228	169 (74%)	59 (26%)

Most of our patients were anemic. The mean Hb level in CRRT, SLED and PD groups was 9.72 g/dl, 9.76 g/dl and 9.61 g/dl respectively. None of these values was significantly different from each other and the overall mean Hb level of 9.59 g/dl. Kitchlu et al. 2015 [29] found similar baseline Hb levels in CRRT group and SLED group, 8.6 g/dl

and 8.97g /dl with overall mean of 8.72 g/dl. Similarly Schwenger et al (2012) [109] reported similar baseline HB levels in two groups, sustained low efficiency dialysis using a single-pass batch dialysis system, SLED-BD and continuous veno-venous hemofiltration CVVH 9.06 g/dl and 8.97 g/dl with overall average of 9.01 g/dl. Schefold et al. 2014 [111] also reported very similar values of overall mean Hb of 10.5g/dl, with nearly equal mean Hb levels in intermittent hemodialysis, IHD (10.6 g/dl) and continuous veno-venous hemofiltration and CVVH group (10.4g/dl).

Indications for RRT:

The conventional indications for renal replacement therapy are:

1.1.Fluid overload resistant to diuretic therapy

1.2. Metabolic acidosis (pH<7.15) refractory to medical management

1.3. Hyperkalaemia (*K*>6.5 mEq/L) refractory to medical management

1.4. Uraemic symptoms or signs (encephalopathy, pericarditis, and bleeding diathesis)

1.5. Poisoning with a dialyzable drug or toxin

1.6. Hyperthermia refractory to regular cooling techniques

1.7. Life-threatening electrolyte derangements in the setting of acute kidney injury

1.8. Progressive azotaemia or oliguria unresponsive to medical management. [26]

In our study the most common indication for RRT was refractory metabolic acidosis in 66 patients (26.9%), followed closely by uremia in 63 (25.7%) and refractory hyperkalemia in 62 patients (25.3%). The least common indication was refractory fluid overload in 54 patients (22.0%).

Refractory fluid overload (91%) and refractory metabolic acidosis (79%) were the most common indications for RRT (SLED) in the study by Sharma et al. [119] Gabriel et al. (2009) [106] reported that Uremia/ azotemia was the reason for the initiation of RRT in 62% of their patients while hypervolemia/azotemia was the indication in 18.5%

patients. George et al. did not report the group wise indication of RRT but have mentioned that they used any one or a combination of blood urea 150 mg/dL or higher, serum creatinine 3 mg/dL or higher, serum potassium 6 mEq/L or higher, metabolic acidosis with arterial pH 7.2 or lower, together with hourly urine output of less than 0.5 mL/kg for more than 12 hours despite correction of volume depletion as indications to start RRT. [28]

All our patients required inotropes to maintain blood pressure. At our centre, as a routine, patients with AKI requiring RRT who can maintain their systolic blood pressure >90mmHg are managed by IHD or SLED and those who cannot, are taken up for CRRT or PD in accordance with the hemodynamics and logistics. The decision for a particular type of modality was taken by the treating unit. The overall mean MAP in our study population was 71.4 mmHg on inotropes, and the group wise MAP was 71.39 mmHg, 71.47 mmHg and 71.38 mmHg in CRRT, SLED and PD groups respectively. The baseline MAP did not differ significantly between the three groups. Inotropes were escalated when needed to maintain desired blood pressure. Fieghen et al. (2010) [30] also reported similar MAP in CRRT and SLED groups, 74.1 and 76.4 respectively, and an overall mean MAP of 74.8 mmHg. Marshall et al. (2001) [98] reported a mean MAP of 72.5 mmHg while Kumar et al. (2000) [96] reported a mean MAP of 68.2 mmHg. Schefold et al. (2014)[111] also reported a mean MAP of 71.5 mmHg, with no significant difference between iHD group and CVVH group. The mean MAP did not differ between groups in most studies comparing different modalities of RRT.

The baseline mean hemodynamic parameters in our study population demonstrated the indices of circulatory failure. The mean baseline pulse rate in our study population was 113.4 bpm, which was only slightly different between the groups. Kielstein et al. 2004 [104] reported that MAP, heart rate, CO, and SVR were similar in patients treated with extended dialysis (SLED/EDD) and CVVH. In Kielstein et al. 2004 [104] with respect to these hemodynamic variables, there were no significant

differences between extended dialysis and CVVH, either before or immediately after the start of the treatment. Kumar et al. 2004 [102] in a study comparing SLED and extended daily dialysis (EDD) reported that the average MAP was maintained in similar ranges for both groups of patients. Fieghen et al. [30] also observed that patients treated with SLED and CRRT had similar blood pressure at the onset of RRT. In Schefold et al. 2014 [111], the mean HR was 104.3 bpm with almost no variation between the two groups.

The central venous pressure (CVP) remains the most frequently used variable to guide fluid resuscitation in critically ill patients.[120] In addition to being an indicator of fluid resuscitation, a raised CVP is also indicative of underlying condition which leads to circulatory overload which in itself can be a precipitant of AKI. The incidence of acute kidney injury is increased in patients with sepsis or with congestive heart failure who have elevated CVP values.[121] We recorded CVP at baseline and at frequent intervals and used high CVP as a marker of fluid overload and improving CVP as a marker of correction of fluid overload. The mean baseline CVP in our patients was 13.06cm H2O with no significant intergroup difference while in the study by Schefold et al.[111], the mean CVP was 14.4 cm H2O, with minimal difference between iHD and CVVH groups (14.7 vs 14.2).

Chronic kidney disease (CKD) is a very well known risk factor for development of acute kidney injury (AKI) during hospitalization. As an exclusion criterion, we excluded dialysis dependent patients but the premorbid levels of serum creatinine which were recorded in previous kidney function tests available with the patients were noted and recorded, to track the effect of this comorbidity on the mortality. The overall mean level of premorbid creatinine was 2.55 mg/dl in the entire study population. The mean premorbid serum creatinine levels in all three groups were 2.95, 2.22. 2.45 mg/dl in CRRT, SLED and PD groups, respectively. While the values obtained in the CRRT and PD groups were comparable to each other, the premorbid creatinine concentration differed significantly between the CRRT and SLED group

(2.95 vs 2.22). Other studies which have mentioned premorbid creatinine levels also show similar levels as ours, with minimal difference between groups. In their study, Marshall et al 2001[98] observed the premorbid creatinine levels to be 3.42*mg*/*dL while* Schwenger et al. (2012)[109] observed overall serum creatinine levels of 2.57 mg/dl (SLED-BD vs CVVH; 2.59 vs 2.55). Kitchlu et al. 2015**Error! Bookmark not defined.**[29] reported lower pre-morbid serum creatinine levels of 1.48 and 1.53 mg/dl for CRRT and SLED groups, respectively.

A low serum HCO_3^- and a pH of less than 7.40 upon ABG analysis confirm metabolic acidosis. We used improvement in both pH and Hco3 to demonstrate a correction of metabolic acidosis. Baseline values of these two parameters were recorded and followed over the course of the disease. The overall mean serum bicarbonate level in our study population was 12.83 mmol/L. The mean values for serum HCO_3 were 12.94, 12.84 and 12.50 mmol/L for CRRT, SLED and PD groups, respectively. We found no significant difference between these groups. Other studies have reported relatively higher levels of baseline bicarbonate in their series; this could be explained by the selection bias in our study as we included only hemodynamically unstable patients in our study. Schefold et al.[111] reported baseline bicarbonate levels of 22.2 mmol/L, with miniscule difference between iHD and CRRT groups. Kitchlu et al.[29] reported a mean serum bicarbonate level of 18.8 mmol/L overall, which varied slightly between the two groups; CRRT, 18.6 mmol/L and SLED, 19.2 mmol/L. Similarly Marshall et al. 2001 [98] and Marshall et al. 2004[100] reported baseline bicarbonate levels of 20.36 mmol/L and 20.5 mmol/L respectively.

On the day of admission to the ICU, the average pH in our patients was 7.14, while mean serum creatinine, serum urea and UOP were 8.90 mg/dl, 193.18 mg/dl and 550.12 ml/24 hours. These values did not differ significantly between groups. The values of these parameters in available studies are given in the table 51. In all these studies, though these values were different from ours, there were no significant intergroup differences within the study.

Table 51: Parameters on day of admission to ICU										
Day 1 parameters	**Kitchlu 2015** [29]	**Marshall 2001** [98]	**Schwenger 2012** [109]	**Kumar 2004** [102]	**Baldwin 2006** [105]	**Kielstein 2004** [104]	**Gabriel 2009** [106]	**George 2011**[28]	**Schefold 2014**[111]	**Present study**
S.Creat. (mg/dl)	2.67	3.42	2.57	4.6	3.17	3.78	5.9	4.85	3.61	8.90
S. Urea (mg/dl)	105.15	143.2	135.1	170.6	101	83.5	244		158.2	193.18
UOP (ml/24hrs)	347.5		2713				279		820.4	550.12
pH	7.29		7.38						7.32	7.14

AKI is a complex disorder revolving around the interplay of patient factors and their environments. The phenotype and etiology of AKI may differ considerably by region and by resources. [10] In our study cardiac failure, pneumonia and undifferentiated sepsis were the three most common causes of AKI, playing the etiological role in 19.6%, 18.8% and 16.7% patients, respectively out of the total sample of 245 patients. Other common conditions leading to AKI in our patients were dengue (9.8%), pyelonephritis (8.6%), pregnancy related (6.9%), meningitis (4.9%), pancreatitis (4.5%) and malaria (4.1%). Among the uncommon etiological factors were leptospirosis (3.3%) and snake bite (2.9%).

The majority of our patients initially presented with multiple organ failure. Most common underlying reason (75.5% of patients) for development of multiple organ failure at baseline was severe sepsis and septic shock. In line with previously published larger clinical studies in patients with AKI, severe sepsis/septic shock due to pneumonia was the major underlying pathology in our study population. Sepsis was similarly very common in most other studies the percentage of patients with sepsis in various studies (table 52). This suggests that sepsis of any origin like pneumonia, pyelonephritis, or secondary to other infections is the most common cause/precipitating event leading to AKI, all over.

Table 52: Prevalence of Sepsis in various studies

Study	Sepsis
Present Study	75.5%
Kumar 2000 [96]	50%
Kielstein 2004 [104]	82.5%
Berbece 2006 [103]	35.3%
Gabriel 2009 [106]	44.5%
Marshall 2010 [108]	45.5%
George 2011 [28]	38%
Schwenger 2012 [109]	54.0%
Schefold 2014 [111]	68%
Jaryal 2017 [27]	75%
Sharma 2020 [119]	93%

Schefold et al. 2014 [111] reported sepsis in 68% and cardiac failure as an etiological factor for AKI in 18.4% of their patients respectively, stroke in 23%, pancreatitis in 6.8% and haemorrhage in 2% of their cases. George et al. 2011[28] has reported leptospirosis and snake bite as a cause of AKI in 10% and 6% of their patients.

Shock of any origin is almost always associated with renal hyoperfusion which leads to the pre-renal azotemia, sometimes followed by an irreversible injury to the nephron. A common mechanism of AKI in most studies was hypoperfusion leading to ATN. In our study shock was present in 100% of the patients, as we included only those patients in our study that required vasopressors to maintain BP.

Table 53: Prevalence of hypoperfusion as a precipitant of AKI

	ATN/hypoperfusion
Kumar 2000 [96]	43%
Berbece 2006 [103]	66%
Gabriel 2009 [106]	85.5%
Marshall 2010 [108]	80.4%
George 2011 [28]	34%
Sharma 2020 [119]	68%

Nearly 95% of the patients in our study developed AKI secondary to medical causes while 5% developed AKI following surgical ailments or post procedures e.g post-colectomy, abdominal surgery etc. Similar findings have been reported in the literature. Schefold et al. 2014 [111] has also reported similar percentages in their trial, 94% of their patients had AKI of medical causes, 5.2% secondary to surgical causes and 0.8% following trauma. Some studies have reported smaller percentage of medical patients. Kitchlu et al [29] reported AKI secondary to medical causes in approximately 73% cases, while 23.7% developed AKI secondary to cardiac surgery and 3.4% after AAA repair. Kumar et al. 2000 [96] reported AKI secondary to medical illness in nearly 80%

cases and surgical illness in 19% patients. George et al 2011 [28] similarly reported nearly 80% cases following medical conditions in their study and secondary to recent surgery in 12% of cases and Gabriel et al. 2009 [106] reported over 76% medical causes and 22.5% after recent surgery in their study.

The characters of AKI are different in some aspects among different hospital settings and ICUs. [122] In our study, 77% of our patients were managed in Medical-Surgical Intensive Care Unit (MICU/SICU) while the rest were managed in cardiac care unit (CCU). Fieghen et al. 2010[30] reported that in their study 65% of the patients were managed in Medical-Surgical Intensive Care Unit (M/SICU), 21% in Cardiovascular Intensive Care Unit (CVICU) and 9% in Coronary Care Unit (CCU). Kitchlu et al. 2015 [29] managed 68.5% of their patients in M/SICU and 31.5% in CCU.

There is ever increasing need of RRT in intensive care scenario where number of patients with multiple comorbidities and hemodynamic instability is continuing to increase. AKI is associated with a multitude of risk factors that disrupt the homeostatic processes of the kidneys. Its complexity stems from pre-existing co-morbidities of patients that vary in severity, thereby making an overarching systematic treatment and management protocol difficult to deliver to patients suffering from AKI. Thus, recognizing the co-morbidities that predispose patients to AKI is important in AKI prevention and treatment. The most common comorbid condition present in our patients was diabetes mellitus, present in 120 patients (49%) followed by hypertension and CKD, seen in 116 (47%) and 102 patients (42%), respectively. Other comorbidities were seen with varying frequency, CAD in 86 patients (35%), COPD in 41 (16%) and CHF in 29 (11.8%). In most studies CKD, Diabetes, Cardiovascular diseases (CAD/CHF) and HTN are reported with similar high frequency, as shown in table 54.

Table 54: Comorbid conditions is various studies						
	CKD	Cardiovascular	Diabetes	HTN	COPD	ESRD
Marshall 2001 [98]	51.4 %					10.8 %
Marshall 2004 [100]	25%					
Berbece 2006 [103]						8.8 %
Gabriel 2009 [106]		39.2%				
Marshall 2010 [108]						10.4 %
Schwenger 2012 [109]		33.2%	23.4 %			
Schefold 2014 [111]		15.6% (CHF) +48% (IHD/CAD)	16%		11.2%	
Jaryal 2017 [27]	37.5%		25 %			
Sharma 2020 [119]	33%	28%	43%	56%		
Present study 2021	42%	11.8% (CHF) + 35% CAD	49%	47%	16%	

We investigated the impact of severity of underlying illness on the outcomes in our study. In our study we tracked patient status at baseline and during the stay in intensive care units to determine organ function or rate of organ failure by the sequential organ failure assessment score (SOFA score). On the day of admission, the overall mean SOFA score of the total sample was 14.53 while the group wise SOFA score was 14.79, 13.83 and 15.84 in CRRT, SLED and PD groups, respectively. The mean SOFA score was highest in PD group, followed by CRRT group, while patients in the SLED group had the

lowest mean SOFA score on day one. Different studies (table 55) used different scores to measure the disease severity. Similar trends of SOFA score have been observed in other studies. Kitchlu et al. 2015[29] also reported SOFA scores comparable to our study in their study groups. SOFA was higher in CRRT (CRRT 16.4 versus 15.4 for SLED recipients) with p= 0.03.). Fieghen et al. 2010 [30] also assessed SOFA score on day one in IHD, CRRT and SLED groups and reported 9.9, 15.7 and 14.0, respectively (score for IHD was low, p <0.05). Fieghen et al. observed that patients treated with SLED and CRRT had a comparable severity of chronic and acute illness at the onset of RRT [30] While CRRT and SLED had comparable scores, the score In IHD group was significantly low.

Table 55: Disease severity indices used in various studies

Study	Score
Fieghen2010 [30]	Charlson, SOFA
Kitchlu2015 [29]	Charlson, SOFA
Kumar 2000 [96]	APACHE II
Marshall 2001 [98]	APACHE II
Marshall 2002 [99]	APACHE II
Kumar 2004 [102]	APACHE II
Berbece 2006 [103]	APACHE II
Gabriel 2009 [106]	ATNISS, APACHE II
Marshall 2010 [108]	APACHE II
George 2011 [28]	APACHE II, GCS
Schwenger 2012 [109]	SAPS, APACHE II, TISS
Schefold 2014 [11]	APACHE II, SAPS II, SOFA, TISS-28
Datt 2017 [33]	GCS
Sharma 2020 [119]	SOFA
Present Study	SOFA

Sharma 2020 [119] reported a mean SOFA score of 12.2 with 61 % patients had SOFA score more than 11. Berbece et al. 2006 [103] used APACHE II score and reported scores of 26.3 in CRRT and 24.4 in

SLED group. Kumar et al. 2000 [96] also found no significant difference in APACHE II scores between SLED and CVVH groups (Average APACHE II 20.1 vs 17.7, p=0.3). Baldwin et al. 2007 [105] also reported similar findings with average APACHE II scores of 22 and 23 in CVVH vs EDD groups. Kielstein et al. 2004 [104] comparing CVVH with EDD reported significantly higher APACHE II scores than the above given studies, but the values were similar in both groups. (32.3 vs 32.6). Another study by Gabriel et al. 2009 [106] comparing PD with CHD reported APACHE II scores of 26.9 and 24.1 in the two groups, respectively.

Acute kidney injury (AKI) is the most frequent extra-pulmonary organ dysfunction associated with ARDS in ICUs and affects almost 50% of the patients. Development of AKI is an independent risk factor for mortality in ARDS.[123,124] Mechanical ventilation may lead to the development of AKI through haemodynamic factors or ventilator-induced lung injury by triggering a pulmonary inflammatory reaction and subsequent systemic release of inflammatory mediators, as described by Kuiper et al[125] Because of these reasons, high proportion of AKI patients are expected to be mechanically ventilated. In our study overall 60% of our total sample population needed mechanical ventilation while the rest 40% did not. Comparable proportions of patients in all three groups were in need of mechanical ventilation on admission. In the study by Kitchlu et al. 2015 [29] nearly 93% required mechanical ventilation while 88.4% of patients in the study by Schwenger 2012 [109] required mechanical ventilation. Kumar et al. 2004 [102] needed mechanical ventilation in 87% of their patients while Schefold et al.[111] needed mechanical ventilation in 86.4% of their patients. Baldwin et al. 2006**Error! Bookmark not defined.**[105] used in 75% and Gabriel et al. 2009**Error! Bookmark not defined.**[106] in 72% patients. These numbers suggest that a majority of patients with AKI have enough degree of respiratory/ neurological dysfunction to require mechanical ventilation.

Hemodynamic instability is a frequent occurrence in critically ill patients with acute kidney injury (AKI). [126]

In our study 100% of patients required vasopressor support, as we included only hemodynamically unstable patients. Jaryal et al. 2017 [27] also included a similar number of 100% of patients needing vasopressors in their study. A majority of patients in most studies required vasopressor/inotropic support revealing that most patients with AKI are hemodynamically unstable with shock. Fieghen et al. 2010[30] used vasopressors in 65% patients, Kitchlu et al [29] in 85%, Schefold et al [111] in 84% and Sharma et al. [119] in 68% of their patients. In a comparison between CVVH and SLED, Schwenger [109] demonstrated that the net UF and the use of vasopressors were not significantly different with either therapy in their study. Zhang et al. 2015[113] found there were no significant differences in need of vasopressor escalation with EDD in comparison to CRRT.

Improvement in parameters

Course of disease severity, physiological and laboratory indices were used to assess disease severity and progression or deterioration over the course of hospital stay. Disease severity was assessed by using SOFA score. In our study the mean SOFA score to begin with was 14.53, which gradually improved over next 21 days to 4.29. Schefold et al. 2014 [111] also tracked the improvement in disease severity indices, including SOFA score in their study and found that the overall mean SOFA improved from 13.15 on day one to 5.26 in 3rd week.

Our results demonstrated gradual improvement in hemodynamic parameters in the study population. The mean HR improved from 113.40 bpm on day one to 91.28 bpm on day 21. Similar improvement was seen in MAP, SBP and DBP, and CVP. The mean MAP improved from 67.65 mmHg on day one to 77.18 mmHg on day 21. Schefold et al. [111] also tracked the progression in these parameters. In their study the day one mean HR, MAP and CVP was 104.7 bpm, 72.8 mmHg and 14.5 cm H2O respectively. These values gradually improved through

day one to day 21 and they were 91.38 bpm, 72.6 mmHg and 12.41 cm H2O, respectively.

A smaller trial by Baldwin et al. 2006[105] randomized 16 patients to receive three sessions with either CRRT or SLEDD (with an added hemofiltration component), which showed that both fluid removal and hemodynamic parameters were similar in both groups. Kielstein et al. 2004 [104] also reported no significant difference in hemodynamic tolerability and efficacy of fluid removal between the two modalities. Fieghen et al.[30] also demonstrated that the hemodynamic tolerability of SLED did not differ significantly from CRRT. Schwenger et al.[109] demonstrated that blood pressure was well maintained and even tended to be higher after treatment in the SLED group compared to CVVH, although the net UF and the use of vasopressors were not significantly different with either therapy.

Our results show comparable fluid removal with all the three modalities of RRT. When CVP was plotted against time, there was a gradual reduction in CVP in all three modalities with equal effectiveness. Using CVP >14 cm H2O as an index of fluid overload, we classified patients in each group into those with CVP above and below 14 cm H2O. The proportion of patients with CVP above 14 cmH2O came down in all three modalities over five days, but the reduction in proportion of patients with CVP >14 cm H2O was slower in the SLED group at 3rd day, but by 5th day the proportion of patients with adequate fluid removal was similar in all groups. This is explained by the fact that while CRRT and PD are continuous RRT modalities with prolonged session time, SLED was used only intermittently with each session between 4-6 hours long. A smaller study by Baldwin et al. 2006 [105] randomized 16 patients to receive three sessions with either CRRT or SLEDD (with an added hemofiltration component), showed that fluid removal and hemodynamic parameters were similar in both groups.

Zhang et al. 2015 [113] found there were no significant differences in fluid removal between EDD and CRRT. Several studies have shown

that SLED achieves adequate solute removal with acceptable hemodynamics.[96,98,100,103] Kitchlu et al.[29] also demonstrated comparable volume control among SLED and CRRT recipients in the week after RRT initiation and support the findings of previous smaller observational studies.[96,105] Many studies in the literature report efficient fluid removal and metabolic control in patients on CPD (continuous peritoneal dialysis) therapy. [127-132]

The mean urine output on the first day was 550.2 ml/24 hours in our study, and it gradually improved to 2195.2 ml/24 hours by the 21st day. In CONVINT [111], the mean UOP on day one was 788.78 ml/24 hours and improved to a value of 2786.27 ml by the end of 3rd week. None of these values differed between groups at any point in time, showing that each of the modalities of RRT improved the urine output with similar efficacy. The study by Datt et al. 2017 [33] showed similar results. The proportion of patients with oliguria (UOP <400 ml/24 hrs) was calculated after each session of RRT and expressed as the total percentage for each group. To begin with 87.9% of the total 33 patients (29) had oliguria, by the end of the 3rd session only 21.2% (7 of 33) of the total sample had urine output <400 ml/24 hrs.

In our study we found a gradual improvement in the laboratory indices of metabolic balance and the values and progression did not differ significantly between the groups. We found a good metabolic outcome in all patients, and there was no significant difference between the three modalities of RRT. Patient's acid-base balance improved over time in all the three group. Serum lactate, serum bicarbonate, serum urea and serum creatinine levels also improved over time with no difference among the three modalities of RRT.

The mean pH on day one in our study was 7.14 and improved to above 7.25 between day 3 and 5 and was 7.35 at the end of day 21. Similarly the serum lactate, bicarbonate and potassium levels were corrected between day 3 and 5 from mean of 6.60 mmol/L, 10.50 mmol/L and 6.16 mmol/L to 2.76, 17.59 and 4.35, respectively, on day 5. On day

one the mean serum urea and creatinine levels in our patients were 193.18 mg/dL and 8.90 mg/dL and were 115.84 mg/dL and 6.27 mg/dL respectively. These values came down significantly at day 21 to 50.56 mg/dL and 2.04 mg/dL, respectively.

In a study by Schefold et al.[111], a similar method of tracking the improvement in these metabolic parameters was used and they reported that the mean pH, serum creatinine, and serum urea gradually improved in both modalities of RRT with similar efficacy from 7.35, 3.71 mg/dL, 160.36 mg/dL, respectively, on day one to mean values of 7.39, 1.53 mg/dL, and 106.28 mg/dL, respectively. Kielstein et al. 2004 [104] demonstrated an improvement of mean serum urea levels from 81.5 mg/dl on day one to nearly 39.5 mg/dl after 24 hours. Serum creatinine levels improved from 3.75 mg/dl to 1.45 mg/dl after 24 hours. In the study by Gabriel et al.[106] the two groups (PD vs dHD) were similar with regard to BUN, creatinine, bicarbonate, and pH levels to begin with. After 3 and 4 sessions, BUN and creatinine were stabilized at values below 55 mg/dL and 4 mg/dL respectively. Similar encouraging results were observed for pH and bicarbonate: after 3 sessions, these values were stabilized at about 7.4 mEq/L and 22 mEq/L, respectively.[106]

George *et al*. 2011[28] randomized 25 patients each to CRRT and PD group over period of 3 years and demonstrated comparable outcomes with respect to improvement in metabolic parameters and demonstrated that composite correction of metabolic parameters was achieved in about 50% of patients in both groups. In their meta-analysis of EDD vs CRRT, Zhang et al. 2015 [113] found that EDD showed similar efficacy to CRRT in laboratory results (serum urea, serum creatinine, and serum phosphate) during RRT and was associated with lower costs. Baldwin et al. [105] also found that both (CVVHF vs EDD/SLED) techniques achieved correction of several electrolyte abnormalities that were present before the RRT was instituted. This is in keeping with published uncontrolled observations.[133,134] Several other studies have also shown that SLED

achieves adequate solute removal with acceptable hemodynamics.[96,98,100,103]

In our study we demonstrated that while 81% of our patients had severe acidosis on day one (pH<7.2), on day 3 the proportion dropped to 27%. Patients with urea more than 150mg/dl on day 1 was observed in 87% and more than 50% reduction on 3rd day was observed in 69.7% of patients with no significant intergroup difference. Urea reduction ratio was also statistically insignificant in between groups. In the same fashion the percentage of our patients with serum potassium above 5.5 mmol/L, HCO3 below 15 mmol/L, and CVP > 14 m H2O was 88.2 %, 96.7%, and 29.8% respectively, on first day of RRT, while the same percentages on day 3 were reduced to 36.3%, 6.1%, and 5.3%, respectively. In a study by Datt et al. [33], 15 out of 33 (45.45%) patients had a pH of <7.2 on day 1, while one out of 9 survivors (11.1%) had pH<7.2 after third session. Similarly 9/33 (27.27%) of their patients had serum K levels above 5.5 mmol/L, 72.72% had HCO3 levels < 15 mmol/L, 87.88% had UOP <400 ml/24 hrs, 45.45% had serum urea level > 150 mg/dl and 48.48% had CVP > 14 cm H2O on day one, while by the end of third session of RRT only 8.3%, 27.3%, 53.8%, 15.4%, and 30.8 continued with those levels at the end of 3rd session of RRT.

Outcomes of the study patients

There is on-going controversy about the optimal modality for the delivery of renal replacement therapy (RRT) to critically ill patients with acute kidney injury (AKI). It is unclear whether any form of RRT modality improves patient or kidney survival.[29] The mode of RRT and overall outcome in critically ill patients differ according to regional and institutional practices. In our critically ill patients with AKI and hemodynamic instability, the initiation of RRT with either form of RRT (CRRT or SLED or PD) was not associated with a different short-term survival. We found that the overall mean survival at 14 days after RRT was 42.05%. The survival rate in each group was 40.4% in CRRT, 45.4% in SLED and 36.8% in PD group. There was no significant

intergroup variation in these values. No significant effect of RRT modality on the percentage of surviving patients was observed. The study did not provide any evidence for superiority of one form of RRT over other in intensive care settings with regard to survival at 14 days after RRT. Schefold et al.[111] also used 14 days survival as an endpoint and reported an overall survival of 38.4% at 14 days after RRT, the values for iHD and CVVH group did not show any significant difference and were 39.5% and 43.9%, respectively. Gabriel *et al*. also demonstrated comparable survival in PD and daily hemodialysis groups.[106]

In our study the overall 14 day morality was 40.5%, while the 14 day post-RRT mortality was 58.7%. The outcome measure of 30 day mortality was 59% overall; though it varied between groups (CCRT 60.6%, SLED 55.6% and PD 65.8%), the difference was not significant.

In this study the 14 day post RRT mortality was nearly 59%, similarly high mortality rates have been reported in AKI in critically ill patients throughout much of literature. The majority of patients initially presented with established multiple organ failure. The major underlying condition for development of multiple organ failure at baseline was sepsis and septic shock. Besides requiring renal support, most patients required mechanical ventilation and vasopressor support also. This may explain high mortality rates observed in our study. Schefold et al.[111] also used 14 day mortality after RRT as an outcome measure, and found a mortality rate of 61.6%.

In our study, the overall hospital based mortality from all the causes was 59.4%, while this number was slightly different in the three groups: 60.6% in CRRT, 55.6% in SLED and 65.8% in PD. In a study by George *et al*.[28], the combined mortality of entire group of CRRT, and PD was 78% in critically sick patients. The overall in-hospital mortality rates in various studies are given in the table (56). As the values suggest, the overall mortality rates in critically ill patients with AKI are very high ranging from about 50% to 90%. It is difficult to draw any firm

inference from the available evidence regarding choice of RRT in hemodynamically unstable patients in intensive care scenario except that the mode of RRT is not the sole determinant of outcome. CRRT, SLED, PD are equivalent approaches for this general population of critically ill ICU patients.

Table 56: Comparison of overall mortality	
Study	Overall mortality (In Hospital)
Kumar 2004 [102]	63%
Gabriel 2009 [106]	55.8%
Fieghen 2010[30]	51%
George 2011 [28]	78%
Schwenger 2012 [109]	51.3%
Schefold 2014 [111]	57.6%
Kitchlu 2015 [29]	56.5%
Jaryal 2017 [27]	80%
Datt 2017 [33]	88.4%
Sharma 2020 [119]	61%
Present Study 2020	58%

We observed that the overall mean duration to death in our study population was 11.68 days, and the variation between CRRT, SLED and PD was significant. The CRRT group mean duration to death was 11.97 days, while for SLED it was 12.82 days but this difference was non-significant. But the mean duration to death in our PD group was 7.68 days, which was significantly lower than both CRRT and SLED values ($p < 0.05$). This could be explained by higher SOFA score and significant smaller sample size in PD group. In the CONVINT trail, the overall mean duration to death was 17.02 days, which was significantly longer than our result (11.68 days), suggesting that their patients survived for nearly 5 days longer than our patients. There was no intergroup variation in their study; iHD 15.6 days, and CVVH 18.5 days.

The average duration of RRT in our study was 3.66 days with a minimum of 1 day to a maximum of 10 days. In contrast Schefold et al.[111] reported an average duration of RRT of 15.49 days. This difference is possibly because of low threshold for dialysis in their study. As a corollary, the mean duration free of dialysis in our study was 11.72 days, and this value did not differ significantly between the three groups, while the same in Schefold et al.[111] was 3.66 days, with little difference between the two study groups. This is explained by the fact that in Schefold et al.[111] the patients/survivors spent a much longer duration in the hospital before being discharge.

It has been hypothesized that after AKI, autoregulation of blood flow is impaired, with susceptibility to further kidney damage as a result of dialysis-related hemodynamic instability.[135,136] CRRT, SLED and PD are less likely to aggravate hemodynamic instability compared to intermittent hemodialysis. CRRT permits gradual fluid and solute removal and has the purported benefit of improved hemodynamic tolerability compared to IHD [137-139] Long-term kidney outcomes may also be better among patients who received CRRT.[140,141] Kitchlu et al**Error! Bookmark not defined.**[29] demonstrated that surviving SLED recipients are not more likely to remain RRT-dependent as compared to CRRT recipients. PD is hypothesised to cause less fluid fluctuations and possibly helps in smoother recovery of kidney functions. In this study we did not find superiority of one modality over others in increasing the likelihood of renal recovery or making patient dialysis independent.

Out of a total of 103 patients who survived at 30 days in our study, 21 (20.3%) were dependent on RRT at 30 days of admission. A similar percentage of patients in CRRT, SLED and PD were dependent on RRT at 30 days, 22.5%, 18.4% and 21.4%, respectively. In-hospital renal recovery are not affected by RRT modality.[107] Kitchlu et al [29] demonstrated that surviving SLED recipients are not more likely to remain RRT-dependent as compared to CRRT recipients, though their study is limited by a small sample size. Gabriel et al. found rate of recovery of renal function were both similar between the two

groups.[106] Sun et al suggested a higher likelihood of RRT independence in the CRRT group.[112]

Five studies [107,112,142-144] that assessed renal recovery showed a high degree of statistical heterogeneity and found that there was no statistically significant difference between CRRT and SLED. Zhang et al 2015[113] found there were no significant differences in kidney recovery, with EDD in comparison to CRRT. Schwenger et al.[109] noticed a small difference in the time to renal recovery between SLED and CRRT but in order to explain that difference they suggested that it was possible that the longer duration of mechanical ventilation might be responsible for the slight difference observed in the time for recovery of kidney function.[125]

The results of meta-analysis by Kovacs et al.[31] indicate that no one modality (CRRT vs. SLED) was superior concerning likelihood of renal recovery and time to renal recovery. This is hypothesized to be due to the similarity between these modalities in terms of physiologic and hemodynamic alternations in patients. Two small RCTs[104,105] have compared SLEDD and CRRT using invasive monitoring, these authors found no significant differences in all measured hemodynamic parameters (mean arterial pressure, systemic vascular resistance, and cardiac output) between SLEDD and CRRT. They also identified that they have a similar urea and creatinine clearance rate.[25]

As allowed in the study, patients in either group were allowed to be switched to the respective other RRT modality in cases of significant medical reasons (that is, either in cases of severe RRT-modality-associated complications or whenever the other modality should not be withheld for significant medical reasons). In such cases, switching of the respective RRT modality was performed by the attending ICU physician/nephrologist. Most common reasons in our study for switching of RRT modality were as follows:

- SLED to CRRT; continuous severe hypotension with requirement of advanced inotropic support or impossibility of maintaining fluid homeostasis.
- CRRT to SLED: improvement in hemodynamics, patient mobilization, impossibility of performing CRRT without anticoagulation in patients with bleeding complications or repeated filter clotting.
- CRRT to PD: worsening hemodynamics.

In our study 33.3% patients from CRRT, 28.7% from SLED and 36.8% from PD were switched to other modality during the course of treatment. From CRRT, 19.2% were switched to SLED and 14.1% to PD. Similarly from SLED 19.4% were shifted to CRRT and 9.3% to PD mostly because of worsening hemodynamics, while from PD 13.2% went to CRRT and 23.7% to SLED mostly showing improving hemodynamics. Schefold et al [111] switched 19.5% from iHD group and 45.9% from CVVH group into the other modality. Fieghen et al. 2010**Error! Bookmark not defined.**[30] also reported a few switches between RRT modalities. In their study, 1 patient was moved from SLED to CRRT, and 3 to IHD. From CRRT, 4 patients were shifted to IHD and from IHD, 5 patients were moved to SLED and 1 to CRRT. The causes of such change of modality were hemodynamic improvement/deterioration or availability/ lack of adequate nursing staff.

Marshall et al 2010[108] examined mortality rates after a unit-wide switch at 3 hospitals from CRRT to SLED/PIRRT and found that this switch was not associated with any change in mortality rate and that this finding was consistent across the different ICUs. They suggested few advantages of SLED/PIRRT for ICUs. The use of standard iHD equipment improves the cost-effectiveness of managing AKI patients, and flexible treatment schedules result in an acceptable logistic burden to an already busy clinical ICU staff. Of note, previous cost analyses of PIRRT programmes show cost-effectiveness compared to CRRT even after allowance for water purification and continued monitoring.[145,146]

CRRT often necessitates some form of anticoagulation to prevent filter clotting, whereas SLED may be readily performed with no anticoagulation. A session of SLED, especially if performed during the overnight hours, may be scheduled around tests and procedures and is thus less likely to be interrupted. Acute PD is simple, cheap, can be done bedside, lack the risks associated with vascular access and anticoagulation. Observational studies have suggested comparable clinical outcomes in patients treated with SLED as compared to CRRT and PD.[96,98,103,108,147,148] and Datt et al.[33] showed similar results between SLED and PD.

In our study no anti-coagulation was used in 137 study patients. None of the patients in PD group and only 8.3% in SLED group received anticoagulation. Heparin was used in 33.3% and 8.3 % of CRRT and SLED patients respectively while as citrate was used only in the CRRT group, in 58.6% patients. Since the need for anticoagulation often presents a series of practical challenges in critically ill patients who require RRT, the finding that all the patients with PD and the vast majority of SLED sessions could be delivered with no anticoagulation is compelling.[29] Since clinical outcomes of SLED and PD seem comparable to CRRT, the ability to deliver RRT without the bleeding and metabolic complications of current anticoagulation options commonly used in CRRT (e.g., heparin or regional citrate anticoagulation) may represent a major benefit of SLED and PD.

Kitchlu et al.[29] used no anticoagulation in 86.2% of SLED patients and 5.6% of CRRT, citrate in 69.7% of CRRT and heparin in 24.7% of CRRT and 13.8% of SLED patients. Fieghen et al. 2010**Error! Bookmark not defined.**[30] performed all of the CRRT sessions with some form of anticoagulation (76% with regional citrate anticoagulation and 24% with unfractionated heparin). In 75% patients of the SLED group no anticoagulation was used. Remainder 25% were performed with unfractionated heparin. In Kumar's study of extended daily dialysis, the majority of patients (68%) were treated with heparin.[96] In Marshall's

description of SLED, 28% of treatments were performed without heparin.[98]

While some earlier studies assessing SLED did not report significant reduction in the need of anticoagulation in SLED[109,112,107,149], many reports now have demonstrated a significantly lower need for anticoagulation in SLED-treated patients[96,103,104] There is ample evidence now that SLED can be performed without the need or with lesser need for systemic anticoagulation.**Error! Bookmark not defined.**[100]

Also, whenever used the average daily dose of heparin in SLED may be less than CRRT. In their study, Schwenger et al.[109] found that the total amount of heparin administered was slightly, but not statistically significantly lower in patients treated with SLED but Kumar et al. 2004[102] reported the average daily doses of IV heparin anticoagulation were 4,414 and 16,270 U/day for EDD and CHD, $p < 0.0001$. Anticoagulants were omitted during 43% SLED/EDD and 21% of CHD treatment days ($p<0.001$) suggesting that among modality requiring vascular access, SLED has an advantage of requiring no or minimal anti-coagulation.

In terms of no requirement of anticoagulation, peritoneal dialysis is a reasonable choice while continuing to have good efficacy in volume and solute removal, metabolic correction and easy technique. In developed countries, PD is rarely used because of fears about its efficacy [150], but it is often used in resource-strapped countries because of easy availability, low cost, technical simplicity, lack of a bleeding risk, excellent cardiovascular tolerance, low risk of hydro-electrolyte disequilibrium and ease of administration.[151-153]

In our study, the overall mean duration of mechanical ventilation was 7.30 days while in the study by Schefold et al. 2014[111], the mean duration was 7.66 days. In neither of the studies there was any significant difference between the groups in terms of duration of mechanical ventilation.

The overall duration of need of vasopressor agents is indicative of the correction of underlying shock. The correction of shock can result from an adequate management of underlying illness. In our study vasopressors were used for an average of 7.72 days, in contrast Schefold et al.[111] reported that their patients received vasopressors for a mean duration of 4.40 days. We calculated the cumulative dose of vasopressors in all groups, including nor-epinephrine, vasopressin and dobutamine. The overall mean cumulative doses of nor-epinephrine, vasopressin and dobutamine in our study were 559.59 mcg/min, 279.34 Units, and 4.68 grams. No significant difference between the dosages was found between the three groups. Schefolfd 2014 has mentioned the cumulative doses of vasopressors used in a population of 250 patients divided into iHD and CVVH modalities and did not differ between groupss. The overall cumulative dose of vasopressors/ ionotropic agents used in the study was 0.67 g for Epinephrine, 18.5 g Nor-Epinephrine, and 144.2 g Dobutamine. Schwenger et al. 2012[109] did not find any significant difference in the dose of vasopressor agent between SLED and CRRT group.

Mortality and modality

We discovered comparable outcome between the type of modality of RRT used and mortality. Either type of modality (CRRT, SLED or PD) could not influence outcome in the study. Either modality (CRRT, SLED or PD) of RRT proved equivalent approaches for critically ill patients with dialysis-dependent AKI. In our study the 30 day mortality rate was 60.6%, 55.6%, and 65.8% in CRRT, SLED and PD groups respectively. These values were not significantly different from each other. Other studies which compared two or more modalities of RRT found similar results and concluded that the mortality was independent or poorly correlated with the modality of RRT used. In a study comparing IHD, SLED and CRRT (CVVH) Fieghen et al. 2010 [30] found that overall, 51% patients died prior to hospital discharge. In-hospital mortality was 35%, 62% and 63% in patients treated predominantly with IHD, SLED, and CRRT, respectively.

Comparing SLED and CRRT, Kitchlu et al. 2015**Error! Bookmark not defined.**[29] found all-cause mortality at 30 days was 54 % and 61 % among SLED- and CRRT-treated patients. Two randomized trials have compared SLED and CRRT though their findings do not clearly demonstrate the superiority of either modality.[29] Abe et al randomized 60 patients to SLED or CRRT and found no significant difference in survival/Mortality to ICU discharge or 30-day survival (whichever occurred first).[107] In a large clinical trial to compare SLED and CRRT with respect to clinical outcomes, Schwenger et al [109] randomized 232 critically ill patients with AKI to CRRT or SLED and found no difference in survival/mortality in between groups. Schwenger et al. 2012 [109] found an overall In-hospital mortality of 51.3 % with slight variation between SLED (49.6 %) and CVVH (53.0 %). Similarly, Kumar et al. 2004 [102] reported in-hospital mortality rate of 54% for patients treated with EDD and 71% for patients treated with CHD.

In a meta-analysis of four RCTs, including those of Abe and Schwenger et al.[109], on the clinical outcomes of CRRT versus SLED.[107,142,109,154] Nash 2017 [35] did not find any statistically significant differences for the pooled results of mortality (ICU, in-hospital or 30-day) or dialysis dependence comparing CRRT and SLED; however, risk of mortality was slightly lower for SLED. Zhang et al 2015[113] also reported consistent results who also found no significant differences in survival, dialysis dependence or ICU length of stay between SLED and CRRT among included RCTs in their systematic review. [35] In a study comparing PD with CHD, Gabriel et al 2009[106] demonstrated comparable survival in PD and daily haemodialysis and the overall mortality was not different between patients treated with CPD and dHD (58% vs 53% respectively). Uehlinger *et al*.[155] compared outcomes among ICU patients on IHD and CRRT and found comparable outcomes with regard to survival (51% vs 47%). Extended daily dialysis of duration of more than 6 h but <24 h has shown comparable outcome versus CRRT in a meta-analysis of RCTs; however, former modality

was associated with lower mortality risk in meta-analysis of observational studies.[113]

Schefold et al. 2014[111] in CONVINT trial, a single-center trial of CRRT (CVVHF) versus IHD and Kitchlu *et al*.[29] in a cohort study of CRRT versus SLED (8 h session with blood flow rate of 200 ml/min) have demonstrated no difference in outcomes mainly with respect of mortality in any of the therapies in critically ill patients. Kitchlu et al[29] found that all-cause mortality at 30 days was 54% and 61% among SLED- and CRRT-treated patients, respectively, and there were no differences in secondary outcomes between the groups, including the adjusted risk of RRT dependence at 30 days and clinical deterioration within 48 h of RRT initiation. They also concluded that there was no association between RRT modality and mortality within strata of acute illness severity (SOFA ≥ 16 vs SOFA < 16). Ponce *et al*.[32] randomized 143 cases of Intensive Care Unit (ICU) patients requiring dialysis to high volume peritoneal dialysis or extended haemodialysis and found no significant difference in the mortality rate, renal recovery, need of chronic dialysis, and median ICU length of stay. Sun et al completed a retrospective analysis of 65 patients treated with CRRT and 80 treated with SLED and also observed no significant difference in 60-day mortality.[112] Recent data demonstrate that neither the technique of RRT[156,40] nor the dose of RRT[157-159] had an impact on patient survival/mortality**.** The study by George et al/ comparing CVVH and PD, mortality rate was high in both groups (approx. 60%), suggesting death because of other organ involvement.[28] The study by Ajay Jaryal et al.[27] showed comparable survival outcomes in hemodynamically unstable patients treated with CRRT or PD. Several meta-analyses.[139,160-162] have compared conventional intermittent RRT and CRRT and found no significant difference in mortality, and a recent RCT confirmed this result.[111]

Predictors of mortality

The present study did not provide any evidence for superiority of one form of RRT over others in intensive care settings. Our results

suggested that in critically ill patients, the modality of RRT has no significant effect on mortality or survival. Instead strong predictors of patient mortality in our study were the advanced age, overall disease severity (high SOFA score), need of mechanical ventilation, duration of need of vasopressors, low MAP, high CVP and underlying comorbidities like sepsis, CAD, CKD, CHF etc. These findings are paralleled by most other studies of RRT in AKI.

In our study survivors were nearly 8 years younger than nonsurvivors (64.59 vs 56.91 years). In the study by Jaryal et al[27], the mean age of survivors (45.5 years) was approximately a decade less than non-survivors (55.5 years)(*P* = 0.15). George et al. 2011[28] noted that the main factors influencing outcome were the severity of the underlying disease and the need for ventilatory support, but not the modality of dialysis. Our finding that the mean SOFA score was significantly different between the survivor and dead (12.81 vs 15.74) was also corroborated by Sharma 2020[119], who in the subgroup analysis in their study found that mortality was significantly higher in patients with SOFA score more than 11 (P<0.0001). Other studies comparing different modalities of RRT also concluded that mortality was predicted by the severity of underlying disease and not the modality of RRT chosen. Kitchlu et al[29] demonstrated that SOFA >16 was more predictive of mortality than the modality of RRT used.

We found that hemodynamic indicators of circulatory failure differed significantly between the survival and the mortality group. The day one mean SBP (93.39 vs 88.22) and mean MAP (69.84 vs 66.11) were significantly higher in the survival group (p-value <0.005) while as the day one mean CVP (11.58 vs 14.10) and the mean duration of vasopressors (5.81 vs 9.06 days) required was significantly lower. Similar results have been found by various studies including Sharma 2020[119], Marshall et al. 2001 [98], Georgre 2011, and Schefold et al. 2014.**Error! Bookmark not defined.**[111]

The need for mechanical ventilation and the total duration on mechanical ventilation also differed significantly between the survival

and mortality group. Similar to our study, Sharma 2020 [119] found that need for mechanical ventilation was also significantly high in non survivors (P<0.0001). In terms of underlying condition they discovered a significant correlation between CKD and mortality from AKI similar to our study. George et al. 2011 [28] noted that the main factors influencing outcome were the severity of the underlying disease and the need for ventilatory support, but not the modality of dialysis.

We also found a relation between mortality and prolonged need for vasopressors, which was also found by Sharma et al. [119] that inotropic requirement, higher SOFA severity score, acidosis with pH <7.25 and presence of underlying CKD were associated with significant mortality. George et al. also noted that the main factors influencing outcome/mortality were the severity of the underlying disease and the need for ventilatory support, but not the modality of dialysis.[28] In the study by Jaryal et al [27] the survival in AKI was better than CKD with either form of the therapy. They also found comparable survival outcomes in hemodynamically unstable patients treated with CRRT or PD, hence concluded that underlying comorbidity was more important determinant of outcomes rather than mode of RRT. [27]

Limitations of the study:

1. Given the greater pre-existing experience and comfort level with PD and CRRT, it is possible that patients with more severe illness were treated with PD and CRRT preferentially over SLED. This is suggested by the slightly higher SOFA scores in PD and CRRT groups in our study. These differences may bias favourable clinical outcomes in favour of SLED.

2. Our study was restricted to 30-day follow-up and as a result, we were unable to comment on mortality or RRT dependence associated with either modality over the long-term.

3. In the study, patients in either group were allowed to be switched to the respective other RRT modality in cases of significant medical reasons. Although the substantial number of cross-overs could have

influenced our overall findings, differences in both the primary end point and respective mortality rates in the subgroups of patients switched/not switched were not observed.

4. Our study is a single centre observational study. Thus, the inherent limitations of monocentric trials should be kept in mind when analyzing the data.

5. Although in our study 245 patients were analyzed, the sample size in PD of 38 patients only was too small compared to other two groups (CRRT 99 and SLED 108), to definitively evaluate different outcomes between groups.

SUMMARY & CONCLUSION

- This was a prospective cohort hospital based study to assess the efficacy and compare various modalities of RRT in critically ill patients with AKI in the ICUs of a large tertiary care teaching hospital in North India.
- We included 245 patients critically ill patients with AKI from diverse etiology into our study.
- The mean age in our study population was 61.42 years.
- Males were more common than females. Nearly 57% were males, were the rest were females.
- The overall mean Haemoglobin level in our study was 9.59 g/dL.
- The mean baseline haemodynamic parameters were comparable between all three modalities. The overall mean SBP was 90.35 mmHg while the mean DBP was 61.96 mmHg.
- The overall mean level of premorbid creatinine was 2.55 in the entire study population
- The overall mean baseline serum bicarbonate level was 12.83 mmol/L.
- The admission day kidney function tests revealed significant mean serum urea and creatinine levels of 192.8 mg/dL and 8.90 mg/dL, respectively.
- The patients had a significantly reduced 24 hour urine output of overall mean 550.12 ml/24 hours.
- The overall mean admission day pH was 7.14, which suggests that most of our patients had acidosis of some degree.
- The etiology of AKI was varied in our study sample. Cardiac failure, pneumonia and undifferentiated sepsis were the three most common causes of AKI. Other common conditions leading to AKI in our patients were dengue, pyelonephritis, pregnancy related, meningitis, pancreatitis and malaria. Among the uncommon etiological factors were leptospirosis and snake bite.
- Sepsis was the most common immediate cause, leading to AKI in 185 patients in total. An underlying cardiac cause was the

precipitant in 52 patients while haemorrhage was the precipitating event in 8 patients.

- Overall, 233 patients of our total study population (245) developed AKI secondary to medical causes while 12 patients developed AKI secondary to surgical ailments.
- Nearly three-fourths of our study population was managed in medical and surgical ICU while one-fourth were managed in cardiac ICU
- The most common comorbid condition present in our patients was diabetes mellitus, present in 120 patients followed by hypertension and CKD, seen in 116 and 102 patients, respectively. Other comorbidities were seen with varying frequency, CAD in 86 patients, COPD in 41, CHF in 29, pancreatitis in 27, stroke in 22, and malignancy in 15 patients. Most patients concomitantly suffered more than one comorbid conditions.
- The overall mean SOFA score of the total sample was 14.53. The mean SOFA score in PD group was significantly higher than SLED and CRRT group.
- Overall 60% of our total sample population needed mechanical ventilation while the rest 40% did not. Comparable proportions of patients in all three groups were in need of mechanical ventilation on admission.
- All of our patients required vasopressor support from the day of admission, as our study was based only on the patients who required vasopressor support.
- All our patients showed varied degrees of circulatory failure and shock with raised heart rate (HR), decreased BP, and raised CVP (overall mean 13.06 cm H2O). These values were indicative of increased preload and fluid overload state.
- The mean SOFA scores in our study population showed that the patients were significantly sick. The mean SOFA score in PD

group was significantly more than CRRT and SLED group, while the score of CRRT was more than SLED group.

- The mean SOFA scores in all three groups improved with RRT and by day 14, the mean scores in all groups were comparably low.
- The other physiological parameters like HR, MAP, CVP and 24 hour urine output were measured and tabulated on day 1, 3, 5, 7, 10 and 14 and 21. The mean values of these parameters did not differ significantly between the three groups. All these parameters showed gradual improvement over time with mean values at no point differing significantly between the three groups.
- The gradual improvement of these parameters was comparable in all three groups which suggests that all the three modalities of RRT (CRRT, SLED and PD) were equally effective at improving the hemodynamic parameters.
- All our patients from all three study groups had severe metabolic acidosis on the day of admission (overall mean 7.14), with no significant intergroup variation. The acid-base balance improved over time in all the three groups with near equal pace and degree.
- Overall mean serum lactate, serum bicarbonate, serum urea and serum creatinine levels did not differ significantly between the three groups on day 1, and all parameters showed gradual correction over 21 days, irrespective of the RRT modality used. At no point of time was the difference in these parameters significant between the three modalities.
- Survival at day 14 after RRT: As an outcome measure the overall 14 day post-RRT survival was 42% and the group wise survival was similar.
- The overall 14 day morality was 40.5%, while the 14 day post-RRT mortality was 58.7%. The outcome measure of 30 day

mortality was 59% overall. There were no significant intergroup differences.

- The overall hospital based mortality from all the causes was 59.4%.
- The average number of days until death in our study population was 11.7 days. Though this value was very similar between CRRT and SLED groups, the mean duration to death in the PD group was only 7.68 days.
- There was no significant difference among the three groups in terms of days until discharge, days spent on RRT and days free from dialysis.
- The mean hospital stay in our study was 18.8 days, which was slightly different among the three groups, 19.50 days in CRRT, 18.88 days in SLED and 17.27 days in PD.
- Our patients spent an average of 3.66 days on RRT with slight variation between the groups, and were free from dialysis for an average of 11.72 days.
- The mean serum creatinine level at discharge or last contact in survivors was 1.99 mg/dL.
- The overall mean ultra filtrate was 8655.51 ml. There was no significant mean ultrafiltrate variation in between three groups.
- Out of a total of 103 patients who survived till day 30, 21 (20.3%) were dependent on RRT at 30 days of admission.
- Out of the total of 245 patients who were started on a modality of RRT, 78 needed to shift to a different modality of RRT during the course of treatment. Out of 33 patients in CRRT group requiring shift, 19 were shifted to SLED and 14 to PD. In the SLED group 31 were shifted, 21 to CRRT and 10 to PD, while as 14 patients in PD were shifted, 9 to SLED and 5 to CRRT.
- No anti-coagulation was used in 137 study patients. None of the patients in PD group and only 8.3% in SLED group received anticoagulation. Heparin was used in 33.3% and 8.3 % of CRRT

and SLED patients, respectively while as citrate was used only in the CRRT group in 58.6% patients.

- Our patients overall required an average 7.30 days of mechanical ventilation which varied very little between the three groups.
- All our patients required vasopressors in our study and the average number of days of vasopressor support were 7.72 days.
- Older age was a strong predictor of mortality as the patients who survived were nearly 8 years younger than those that did not survive.
- The patients with diabetes mellitus (DM), coronary artery disease (CAD), chronic heart failure (CHF) and chronic kidney disease (CKD) were much more likely to die than those who did not have these three comorbidities. Presence of other comorbid conditions (eg hypertension, COPD, stroke, malignancy, and pancreatitis) did not affect mortality significantly.
- Among those who died the mean SOFA score on day 1 was significantly higher than those who survived (15.74 vs 12.81).
- Indicators of circulatory failure differed significantly between the survival and the mortality group. The mean SBP (93.39 vs 88.22) and mean MAP (69.84 vs 66.11) were significantly higher in the survival group (p-value <0.005) while as the day one mean CVP (11.58 vs 14.10) and the mean duration of vasopressors (5.81 vs 9.06 days) required was significantly lower.
- The need for mechanical ventilation and the total duration on mechanical ventilation also differed significantly between the survival and mortality group. A higher percentage of patients who required mechanical ventilation died, and the mean duration of mechanical ventilation was longer in the mortality group.

CONCLUSION

The present study and most of the literature available do not provide any proof for superiority of one form of renal replacement therapy over other in intensive care settings. The type of RRT does not have a major impact on survival or renal recovery of patients. CRRT, SLED and PD have advantages of convective clearance and better hemodynamic tolerability. The overall success of any form of RRT in ICU is dictated by the expertise, technical suitability of the patient for particular type of renal replacement therapy, and appropriate treatment of the underlying comorbid illness. It is recognized that more than one therapy can be utilized for managing patients with AKI. Transitions in therapy are common and reflect the changing needs of patients during their hospital course. All the three modalities, (CRRT, SLED and PD) have their own advantages and these therapies are often complimentary to each other during the hospital course. Beside this, underlying illness is more important marker of outcome rather than type of RRT. Thus, the choice of therapy in intensive care settings should be based on delivery with no anticoagulation, experience, technical feasibility of the procedure, hemodynamic toleratibility, limitations of fluid removal, staff expertise and resources. Our data supports the view that either form of RRT may be considered for a general population of critically ill patients with dialysis-dependent ARF treated in an intensive care unit. Pending adequately powered randomised trial that will evaluate the impact of these modalities on patient survival and function recovery, either of these modalities seem complimentary to each other depending on costs, timing, local availability of RRT modality, and greater logistic complexity.

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KEY TO MASTER CHART

Group:

1. CRRT

2. SLED

3. PD

Gender

1 M

2 F

Etiology of AKI

1. Pneumonia

2. Pyelonephritis

3. Dengue

4. Malaria

5. Leptospirosis

6. Undifferentiated sepsis

7.Pregnancy related

8. Meningitis

9 Pancreatitis

10 Snake bite

11. Cardiac failure

Category

1. Medical

2. Post surgery

Reason for AKI

1. Sepsis

2.Cardiac failure

3. Haemorrhage

Indication of dialysis

1.Fluid overload

2. Hyperkalemia

3. Uremia

4. Metabolic acidosis

30 day RRT dependence

1 YES

2. NO

ICU type medical-surgical-, cardiovascular/CCU

1 Medical ICU/Surgical ICU

2 Cardiac Care Unit

RRT switch

1 YES

2. NO

RRT Switch to

1. CRRT

2 SLED

3.PD

Anticoagulation heparin

1 Heparin

2 Citrate

3 None

Serial no.	Name	MRD	Age	Gender	Group	Etiology of Aki	Category	Baseline Hb (g/dl)	Premorbid creatinine(mg/dl)	Hco3 baseline	Need for vasopressor	SBP	DBP	Reason for AKI	DM	HTN	COPD	CAD	CKD	CHF	Neurology/post stroke	Malignancy	Pancreatitis	Indication of dialysis	SOFA score_	SOFA score day 0	SOFA score day 1	SOFA score day 3	SOFA score day 5	SOFA score day 7	SOFA score day 10	SOFA score day 14	SOFA score day 30	s. Creat	s.Creat_day 0	s.Creat_day 1
1	LS	792712	67	2	1	10	1	11	-	12	Yes	90	62	1	Absent	Absent	Absent	Present	Present	Absent	Absent	Absent	Absent	1	-	16	16	14	14	15	10	-	-	-	8.9	8
2	SS	807239	68	2	2	10	1	10	-	16	Yes	84	60	1	Present	Present	Present	Present	Absent	Absent	Absent	Absent	Absent	3	-	15	14	13	-	-	-	-	-	-	9	9.4
3	BS	921738	70	1	1	2	1	-	4	13	Yes	88	58	1	Present	Absent	Absent	Present	Present	Absent	Absent	Absent	Present	2	-	15	16	14	14	9	11	10	-	-	7.4	8
4	HR	973360	45	2	1	5	1	10.5	-	12	Yes	88	63	1	Present	Present	Absent	Absent	Present	Absent	Absent	Present	Absent	2	-	12	12	13	10	6	6	5	3	-	7.8	7.8
5	JK	977185	76	1	1	2	1	12	-	9	Yes	88	64	1	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Present	4	-	12	12	10	6	5	6	5	4	-	7.6	7
6	LB	924486	55	1	2	2	1	9.2	-	15	Yes	96	60	1	Absent	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	3	-	11	12	8	9	5	6	6	4	-	8.9	6.9
7	MB	447628	52	2	2	8	1	9	-	13	Yes	90	65	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	11	11	10	9	10	8	6	5	-	9.8	10.5
8	SK	938771	69	1	3	11	1	9.4	-	12	Yes	84	64	2	Present	Present	Present	Present	Absent	Absent	Absent	Absent	Absent	3	-	14	16	15	-	-	-	-	-	-	9	10.6
9	AS	801216	45	1	2	3	1	9	-	16	Yes	90	64	1	Present	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	16	15	14	12	11	11	-	-	-	8.7	8.7
10	YS	917434	66	2	1	6	1	10.2	-	13	Yes	88	58	1	Present	Present	Absent	Absent	Absent	Absent	Present	Absent	Absent	3	-	17	16	15	17	12	10	9	-	-	9.2	9
11	MR	702786	54	2	1	3	1	10.4	-	12	Yes	96	66	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	11	11	12	13	10	8	7	3	-	11	11
12	SS	873501	55	1	2	3	1	11.2	-	11	Yes	86	62	1	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	14	14	12	12	-	8	6	6	-	11.8	11
13	CL	923806	54	1	2	11	1	10	-	10	Yes	98	64	2	Present	Present	Present	Present	Absent	Absent	Absent	Absent	Absent	3	-	11	12	10	9	6	8	6	4	-	8.5	11.8
14	SS	468714	56	1	2	5	1	11	-	15	Yes	90	60	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	2	-	12	12	11	10	9	9	6	4	-	10.5	7.9
15	GS	800079	67	1	2	3	1	8.9	-	11	Yes	90	66	1	Absent	Absent	Absent	Absent	Present	Absent	Absent	Absent	Absent	1	-	14	14	13	12	14	16	-	-	-	10.9	10.9
16	JR	373727	56	2	1	11	1	11.5	2.8	14	Yes	96	65	2	Present	Present	Absent	Present	Present	Absent	Absent	Absent	Absent	4	-	11	11	12	10	6	6	6	4	-	6.9	6.9
17	JB	676457	65	1	1	3	1	12	-	14	Yes	90	60	1	Present	Present	Absent	Absent	Present	Present	Absent	Absent	Absent	1	-	18	17	16	18	-	-	-	-	-	12.7	12
18	TR	947518	60	2	2	11	1	10.3	-	12	Yes	90	60	2	Present	Present	Absent	Present	Absent	Present	Absent	Present	Present	4	-	16	16	14	-	-	-	-	-	-	9	8.9
19	SS	710888	72	1	2	3	1	10	-	11	Yes	90	66	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	14	15	13	13	10	12	-	-	-	12	12
20	TS	249300	66	2	2	1	1	9.4	-	15	Yes	96	62	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Present	2	-	11	10	11	9	11	7	5	4	-	9.9	10.4
21	BK	249918	54	1	2	6	1	10.3	-	15	Yes	88	62	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	16	16	15	14	12	10	-	-	-	9.7	10
22	NK	882105	68	1	2	6	1	10	1.6	12	Yes	88	64	1	Absent	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	1	-	14	14	13	14	12	10	-	-	-	9.1	10
23	AS	939682	65	2	3	1	1	10	1.6	12	Yes	90	60	1	Present	Absent	Absent	Absent	Present	Absent	Absent	Absent	Absent	4	-	11	15	14	-	-	-	-	-	-	8	8.6
24	GS	4470	68	1	2	11	1	11.8	-	15	Yes	86	62	2	Absent	Absent	Absent	Present	Present	Absent	Absent	Absent	Absent	2	-	14	15	13	14	13	10	9	-	-	7.4	8
25	AS	945030	70	1	3	1	1	10	-	13	Yes	84	60	1	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	1	-	16	21	17	16	15	14	-	-	-	7.5	7.6
26	VK	453002	58	1	1	6	1	10	2.5	16	Yes	88	60	1	Absent	Absent	Present	Absent	Present	Absent	Absent	Absent	Absent	3	-	17	20	18	15	10	9	-	-	-	6.3	7
27	G	543717	60	1	2	4	1	9	-	16	Yes	88	48	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	14	14	13	10	9	9	6	4	-	8.9	10.6
28	HS	934823	58	2	3	7	1	8.6	-	18	Yes	88	50	1	Absent	Absent	Absent	Absent	Present	Absent	Present	Absent	Absent	2	-	17	12	13	10	8	7	5	4	-	7.8	8.1
29	KK	931388	56	2	3	1	1	11	-	7	Yes	96	61	1	Absent	Absent	Present	Absent	Present	Absent	Absent	Absent	Absent	3	-	16	11	12	8	9	8	6	5	-	6.9	7
30	KS	788400	64	1	1	9	1	9.4	-	12	Yes	84	64	1	Absent	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	3	-	16	15	15	-	-	-	-	-	-	10.6	11
31	CS	479558	56	1	2	4	1	10.4	-	12	Yes	96	66	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	14	13	12	11	11	8	6	4	-	11	10.4
32	JK	159326	45	2	2	9	2	12.6	-	12	Yes	98	60	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	12	12	11	10	11	9	6	4	-	9.5	11
33	WM	686761	54	2	3	2	1	10.5	1.5	12	Yes	88	63	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Present	Absent	2	-	16	11	13	10	6	7	6	5	-	8	7.8
34	SC	162101	78	1	1	1	1	7.6	2	11	Yes	90	60	1	Present	Present	Absent	Present	Present	Absent	Absent	Absent	Absent	1	-	16	15	14	15	15	16	-	-	-	10.4	10.4
35	MS	964206	55	2	1	3	1	10	-	15	Yes	90	60	1	Absent	Absent	Absent	Absent	Absent	Absent	Present	Absent	Absent	2	-	11	11	12	12	10	9	7	5	-	10.5	11
36	MBS	925970	56	1	2	9	1	9.6	-	16	Yes	88	48	1	Absent	Present	Absent	Absent	Absent	Absent	Absent	Absent	Present	4	-	9	9	9	9	8	6	5	4	-	10.5	11.5
37	SS	937686	56	2	1	1	1	9	-	15	Yes	96	66	1	Present	Present	Present	Absent	Absent	Absent	Absent	Absent	Absent	3	-	10	10	11	8	7	4	6	3	-	10	10
38	HS	921055	73	2	1	1	1	11	-	14	Yes	84	60	1	Present	Present	Absent	Present	Present	Absent	Absent	Present	Absent	2	-	17	16	16	15	14	12	-	-	-	9.9	9
39	RB	904184	54	2	1	6	1	8.5	-	13	Yes	90	65	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	12	12	11	10	10	8	7	4	-	9.8	9.8
40	HS	934418	65	1	3	6	1	10.2	-	18	Yes	96	61	1	Absent	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	19	18	16	13	7	8	5	3	-	7.2	8.2
41	SS	422332	58	2	2	9	1	10.2	-	13	Yes	88	58	2	Present	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	15	15	14	14	10	8	8	-	-	11	11
42	KK	23530	54	1	1	5	1	9.4	-	13	Yes	84	60	1	Absent	Absent	Absent	Absent	Absent	Absent	Present	Absent	Absent	4	-	17	16	16	15	14	11	9	-	-	7.6	8
43	AS	946902	45	1	1	7	1	9.6	-	14	Yes	88	50	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	10	10	10	9	9	6	7	5	-	9.8	9.8
44	DRS	764260	64	1	1	1	1	10	-	10	Yes	86	64	1	Absent	Absent	Absent	Absent	Present	Present	Absent	Absent	Present	2	-	17	18	16	14	15	16	11	-	-	7.3	7
45	DK	921413	55	1	1	6	1	10	-	12	Yes	90	60	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	13	13	12	10	10	9	7	4	-	8	8
46	IK	625773	54	2	1	11	1	7.4	-	16	Yes	90	64	2	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	1	-	16	19	18	16	17	18	16	-	-	8.2	8
47	VKM	32394	52	1	1	6	1	10	3.5	12	Yes	88	64	1	Absent	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	1	-	16	15	14	14	15	9	8	-	-	8.4	9
48	RKJ	42767	55	2	1	1	1	8.5	2.6	14	Yes	100	62	1	Present	Present	Absent	Absent	Present	Present	Absent	Absent	Absent	1	-	10	10	10	9	6	4	-	-	-	7.1	7.5
49	RK	963889	58	2	2	11	1	11	-	11	Yes	90	60	1	Absent	Present	Present	Present	Absent	Absent	Absent	Absent	Present	2	-	15	16	15	14	14	15	-	-	-	8.3	8.3
50	KS	782645	45	2	1	7	1	11	-	12	Yes	86	66	1	Present	Present	Absent	Absent	Absent	Present	Present	Absent	Absent	2	-	15	15	14	15	12	10	-	-	-	9.9	10
51	MK	780420	67	2	1	9	1	11.4	-	10	Yes	88	62	1	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	2	-	17	17	15	17	17	18	-	-	-	11.3	12
52	SG	939363	56	1	3	6	1	11.4	-	10	Yes	88	62	1	Present	Present	Absent	Absent	Absent	Absent	Absent	Present	Absent	3	-	10	17	16	14	15	-	-	-	-	11	11.3
53	BS	550977	58	2	1	1	1	10.2	-	18	Yes	90	62	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	14	18	12	10	10	9	7	4	-	8.2	9
54	ND	441156	56	1	2	3	1	12	-	15	Yes	88	56	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	2	-	11	11	9	11	9	8	6	3	-	8.6	7.9
55	KM	942047	45	2	3	1	2	11	1.8	12	Yes	90	62	1	Absent	Absent	Absent	Absent	Present	Absent	Absent	Absent	Present	2	-	11	15	16	-	-	-	-	-	-	8	8.9
56	MR	449952	61	2	2	4	1	12.5	-	19	Yes	98	64	1	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	Absent	4	-	12	12	11	10	9	9	7	3	-	6.4	9.9
57	HK	815312	65	2	2	2	1	9.4	1.8	10	Yes	90	65	1	Present	Absent	Present	Present	Present	Absent	Absent	Absent	Absent	2	-	14	14	15	15	14	13	-	-	-	9.8	9.8
58	HS	938365	75	1	3	11	1	11	-	12	Yes	92	66	2	Present	Present	Present	Present	Present	Absent	Absent	Absent	Absent	2	-	14	16	14	14	12	13	-	-	-	8	8.8
59	GS	767117	55	2	1	4	1	12.6	-	12	Yes	98	60	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	11	11	13	12	10	9	7	4	-	9.5	9
60	SK	425055	55	1	1	1	1	12	4	8	Yes	90	62	1	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	3	-	14	14	12	9	10	5	5	3	-	11.2	11
61	DK	775795	62	1	1	3	1	10	-	13	Yes	88	68	1	Present	Present	Present	Present	Present	Absent	Absent	Absent	Present	1	-	15	15	14	15	16	15	-	-	-	10.8	10.8
62	GK	894755	56	2	1	8	1	10	-	12	Yes	88	62	1	Present	Absent	Present	Absent	Present	Present	Absent	Absent	Absent	4	-	16	17	14	-	-	-	-	-	-	6.9	6
63	BK	811581	68	1	2	1	1	8.5	-	12	Yes	86	64	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	15	15	13	13	13	12	11	-	-	10	9.2
64	KK	506487	54	2	2	6	1	9	-	19	Yes	96	61	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	11	11	9	9	9	8	6	3	-	11	11.4
65	SD	973406	45	2	1	1	1	13	3	10	Yes	98	64	1	Present	Present	Present	Present	Absent	Absent	Absent	Absent	Absent	3	-	12	12	9	8	7	7	5	3	-	8.5	8
66	RK	882132	65	1	2	2	1	11	-	10	Yes	88	48	1	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	15	15	14	12	-	10	9	4	-	6.4	9

Serial no.	Name	MRD	s.Creat_day 3	s.Creat_day 5	s.Creat_day 7	s.Creat_day 10	s.Creat_day 14	s.Creat_day 30	s. Urea	s.Urea_day 0	s.Urea_day 1	s.Urea_day 3	s.Urea_day 5	URR	s.Urea_day 7	s.Urea_day 10	s.Urea_day 14	s.Urea_day 30	UOP (24hrs)	UOP (24hrs) day 0	UOP (24hrs) day 1	UOP (24hrs) day 3	UOP(24hrs)_day 5	UOP(24hrs)_day 7	UOP(24hrs)_day 10	UOP(24hrs)_day 14	UOP(24hrs)_day 30	Ph	Ph_day 0	Ph_day 1	Ph_day 3	Ph_day 5
1	LS	792712	7.6	6.8	5.4	4.4	-	-	-	175	180	100	90	44.4	86	92	-	-	-	500	500	850	500	650	600	-	-	-	7.14	7.16	7.19	7.25
2	SS	807239	5.6	-	-	-	-	-	-	149	149	70	85	53.0	-	-	-	-	-	450	450	350	430	450	1000	-	-	-	7.15	7.15	7.19	-
3	BS	921738	6.9	5.2	4.1	3.8	4.2	-	-	175	180	101	113	43.9	89	49	98	-	-	300	300	1350	1500	1450	1300	800	-	-	7.26	7.29	7.32	7.33
4	HR	973360	7.1	5.6	6	4.2	4	3	-	298	304	165	91	45.7	87	43	68	40	-	700	700	700	600	1000	800	1000	1200	-	7.2	7.21	7.3	7.43
5	JK	977185	4.5	4.3	4	5.5	5.1	5.2	-	203	203	101	100	50.2	65	86	65	55	-	500	500	600	500	1000	1750	1200	1500	-	7.1	7.12	7.26	7.33
6	LB	924486	5.2	6	4.6	6.7	3.9	3.6	-	200	185	87	56	53.0	98	90	45	44	-	700	650	900	1550	1950	1850	2100	2500	-	7.32	7.33	7.17	7.22
7	MB	447628	7.5	9.8	5.5	3.2	2.7	1.4	-	289	198	79	124	60.1	95	73	69	56	-	700	1000	800	1500	1000	2200	2700	3200	-	7.2	7.26	7.29	7.35
8	SK	938771	9.2	-	-	-	-	-	-	255	255	98	129	61.6	-	-	-	-	-	450	800	250	-	-	-	-	-	-	7.1	7.11	7.2	-
9	AS	801216	6.6	3.7	5.1	4.5	5	-	-	178	180	70	118	61.1	65	88	86	-	-	400	500	500	550	800	900	1000	-	-	7.22	7.21	7.24	7.37
10	YS	917434	7.6	6.4	5.7	4.9	3	-	-	194	198	107	62	46.0	198	115	77	-	-	250	250	300	1200	1450	1375	800	-	-	7.1	7.1	7.12	7
11	MR	702786	9.2	8.4	5.3	3.8	2.6	1.4	-	182	184	71	110	61.4	90	75	55	33	-	700	700	800	950	1200	1700	2500	2700	-	7.1	7.1	7.19	7.26
12	SS	873501	12.2	10.7	6.4	2.9	2.1	1.4	-	176	176	93	90	47.2	56	76	44	34	-	500	450	190	150	725	1700	1400	1500	-	7.09	7.19	7.15	7.26
13	CL	923806	4.2	4.5	5	4.4	1.4	1	-	300	275	110	89	60.0	88	120	44	38	-	200	300	600	1800	2600	2200	4200	3550	-	7.15	7.14	7.34	7.34
14	SS	468714	8.6	5.4	7.8	3.4	1.4	1.1	-	242	142	65	94	54.2	81	70	50	40	-	500	400	1450	1200	1980	1800	2200	2400	-	7.1	7.1	7.26	7.42
15	GS	800079	9.8	7.6	8.6	3.2	-	-	-	241	241	92	94	61.8	76	39	78	-	-	550	450	450	1425	1350	1300	700	-	-	7.11	7.17	7.24	7.3
16	JR	373727	4.2	5	4.1	4.2	4.5	3.9	-	199	206	97	110	52.9	114	46	52	46	-	1000	900	500	800	800	900	1500	1500	-	7.11	7.16	7.28	7.44
17	JB	676457	10.5	9.6	-	-	-	-	-	273	280	135	142	51.8	-	-	-	-	-	200	200	550	1300	-	-	-	-	-	7.1	7	7.25	7.19
18	TR	947518	7.3	-	-	-	-	-	-	154	154	73	92	52.6	-	-	-	-	-	675	500	1280	-	-	-	-	-	-	7	7	7.29	-
19	SS	710888	9.8	7.2	2.8	3.5	-	-	-	301	301	119	113	60.5	67	45	-	-	-	350	350	450	250	350	300	-	-	-	7.07	7.07	7.24	7.31
20	TS	249300	7.5	9.4	6.4	3.4	2.7	1.3	-	200	175	95	70	45.7	85	55	50	44	-	900	1000	1950	1400	2100	1950	2100	2500	-	7.11	7.21	7.29	7.42
21	BK	249918	7	6.3	5.5	4.5	-	-	-	197	197	91	90	53.8	67	110	98	-	-	490	450	400	1450	1500	1380	-	-	-	7.2	7.19	7.26	7.39
22	NK	882105	7.5	7.7	5.9	5	-	-	-	178	180	101	90	43.9	66	70	-	-	-	500	600	1390	1300	1400	600	-	-	-	7.13	7.14	7.29	7.45
23	AS	939682	7.5	-	-	-	-	-	-	165	170	83	119	51.2	-	-	-	-	-	450	150	600	-	-	-	-	-	-	7.12	7.19	7.17	-
24	GS	4470	5.8	5.2	2.7	4.5	4	-	-	165	165	73	100	55.8	66	56	-	-	-	350	450	390	1250	1400	1350	1500	1600	-	7.12	7.14	7.16	7.29
25	AS	945030	6.9	6.2	5.7	4.9	-	-	-	178	190	94	100	50.5	94	87	-	-	-	450	800	350	450	550	525	590	-	-	7.1	7.09	7.15	7.19
26	VK	453002	5.2	4.6	4.4	3	-	-	-	165	170	80	83	52.9	66	100	-	-	-	400	400	500	450	600	500	-	-	-	7.06	7.1	7.15	7.28
27	G	543717	7.2	6.7	5.4	2.9	1.9	1.4	-	297	107	55	122	48.6	78	65	59	42	-	1000	900	600	1300	725	1700	1750	1900	-	7.12	7.18	7.28	7.31
28	HS	934823	6.5	6.2	5.5	4.3	2.8	0.8	-	117	117	52	60	55.6	70	65	58	45	-	700	500	600	1400	2400	2400	3200	3500	-	7.21	7.23	7.27	7.3
29	KK	931388	5.5	4.8	3.5	3.1	1.5	0.8	-	201	201	106	80	47.3	90	88	75	40	-	750	1000	600	700	800	1000	1400	1400	-	7.1	7.1	7.25	7.35
30	KS	788400	-	-	-	-	-	-	-	255	255	110	115	56.9	-	-	-	-	-	375	375	-	-	-	-	-	-	-	7.09	7.11	-	-
31	CS	479558	9.2	10.7	7.3	3.8	2.6	1.4	-	290	288	102	180	64.6	150	108	98	64	-	800	700	1250	950	3200	1700	2500	2900	-	7.11	7.1	7.29	7.26
32	JK	159326	7.2	6.5	5.4	5.2	1.5	1.4	-	194	204	93	130	54.4	140	88	58	39	-	800	500	1600	2050	2800	1500	2100	2550	-	7.11	7.18	7.36	7.45
33	WM	686761	7.1	5.6	6.5	4.2	4	3	-	298	298	118	130	60.4	46	122	102	66	-	450	400	500	900	1000	1400	2100	3400	-	7.12	7.21	7.3	7.43
34	SC	162101	9.7	8.8	7.7	6.4	-	-	-	275	275	130	99	52.7	110	89	-	-	-	275	275	400	850	450	775	-	-	-	7.05	7	7.16	7.19
35	MS	964206	8.6	6.5	3.8	3.4	5.7	4.5	-	220	220	103	110	53.2	110	95	80	40	-	500	600	750	1200	1500	1800	2200	2600	-	7.1	7.1	7.26	7.32
36	MBS	925970	7.5	8.2	5.5	5.5	2.8	1.8	-	160	140	61	85	56.4	66	78	55	42	-	600	400	1200	650	1500	2050	2250	2550	-	7.14	7.11	7.15	7.26
37	SS	937686	8.6	6.4	4.9	3.2	2.6	1.1	-	272	272	101	150	62.9	44	66	66	34	-	800	900	1500	1800	2500	2650	2700	2900	-	7.12	7.18	7.26	7.32
38	HS	921055	7.2	6.4	4.8	8.8	-	-	-	197	197	93	114	52.8	84	32	-	-	-	350	500	400	1450	1250	1290	-	-	-	7.11	7	7.24	7.27
39	RB	904184	8.5	7.6	5.5	3.2	3.7	4.4	-	224	230	105	130	54.3	102	99	78	66	-	1000	1000	1200	1500	1800	2200	2700	3000	-	7.16	7.26	7.29	7.32
40	HS	934418	7.6	5.4	5.2	3.5	2.8	1	-	111	111	48	60	56.8	110	75	70	65	-	600	700	1000	1060	1450	1670	2100	2500	-	7.11	7.29	7.32	7.31
41	SS	422332	7.6	7.5	5	2	1.8	-	-	203	140	65	89	53.6	78	98	88	-	-	550	250	300	1200	1500	700	800	-	-	7.1	7.1	7.12	7.24
42	KK	23530	6.9	6.2	5.7	4.9	3.4	-	-	178	180	76	100	57.8	94	69	88	-	-	350	350	400	550	1450	1300	700	-	-	7.1	7.09	7.15	7.19
43	AS	946902	7.6	6.5	4.4	3.4	2.1	1.3	-	204	130	51	150	60.8	120	88	58	39	-	650	650	850	1200	1700	1900	2200	2400	-	7.1	7.09	7.29	7.34
44	DRS	764260	6.4	5.8	4.6	4.4	3.9	-	-	200	200	76	117	62.0	116	97	68	-	-	400	400	750	500	400	700	600	-	-	7.09	7	7.19	7.26
45	DK	921413	6.5	5.4	3.1	2.4	1.8	1	-	166	170	90	93	47.1	65	65	55	42	-	400	500	600	750	1200	1400	1600	1800	-	7.11	7.12	7.25	7.29
46	IK	625773	7.6	6.4	5.1	4.3	6.7	-	-	176	190	81	108	57.4	93	65	33	-	-	400	400	500	550	500	400	350	-	-	7.2	7.21	7.24	7.27
47	VKM	32394	7.5	6.7	5.9	3.9	4	-	-	203	203	106	94	47.8	76	56	98	-	-	300	300	350	700	750	600	800	-	-	7.11	7.14	7.29	7.35
48	RKJ	42767	5.8	5.8	4.8	4	3.8	2.5	-	185	200	93	71	53.5	110	100	98	70	-	450	500	550	700	900	1100	1200	1500	-	7.2	7.22	7.26	7.28
49	RK	963889	5.6	5.5	7.8	4	-	-	-	202	210	102	80	51.4	56	87	-	-	-	550	450	290	1250	1300	1450	-	-	-	7.1	7.1	7.18	7.24
50	KS	782645	8.8	7.2	5.4	3.4	-	-	-	194	200	73	102	63.5	98	102	-	-	-	450	450	475	900	700	1350	-	-	-	7.01	7	7.24	7.18
51	MK	780420	10.4	9.7	8.6	7.2	-	-	-	217	220	87	105	60.5	95	125	-	-	-	550	550	600	800	550	900	-	-	-	7.1	7.12	7.29	7.25
52	SG	939363	10.4	9.7	8.6	-	-	-	-	217	217	101	143	53.5	145	-	-	-	-	370	600	525	710	780	-	-	-	-	7.11	7.12	7.2	7.25
53	BS	550977	7.6	5.4	5.2	3.5	2.8	1	-	111	120	63	91	47.5	85	75	70	65	-	1000	1000	1200	1750	1900	2200	2300	2400	-	7.14	7.19	7.32	7.31
54	ND	441156	6.6	6.8	5.8	4.5	2.9	1.2	-	205	215	101	170	53.0	143	98	44	55	-	800	600	950	1200	1700	2200	2450	2725	-	7.22	7.22	7.255	7.34
55	KM	942047	7.6	-	-	-	-	-	-	175	175	92	106	47.4	-	-	-	-	-	400	500	450	-	-	-	-	-	-	7.15	7.16	7.19	-
56	MR	449952	5.9	7.5	4.5	3.4	2.4	1.1	-	234	224	103	140	54.0	112	99	66	67	-	800	600	1900	900	1200	2500	2900	3500	-	7.12	7.14	7.3	7.32
57	HK	815312	8.2	5.2	4.2	4.4	-	-	-	178	180	101	124	43.9	104	2	-	-	-	300	300	350	500	400	600	-	-	-	7.116	7.116	7.26	7.37
58	HS	938365	8.6	7.4	5.4	4.8	7.6	6.4	-	185	185	88	95	52.4	137	113	-	-	-	450	800	350	590	400	525	750	1200	-	7.12	7.22	7.25	7.37
59	GS	767117	8.2	7.1	5.4	3.2	1.5	1.4	-	215	215	110	130	48.8	113	98	75	62	-	500	600	700	900	1050	1500	2100	2700	-	7.12	7.18	7.26	7.35
60	SK	425055	6.8	6	6	8	5.6	4	-	301	200	143	130	28.5	100	45	68	45	-	650	700	850	600	800	1200	1000	1400	-	7.11	7.12	7.24	7.46
61	DK	775795	9.8	8.4	6.6	6.2	-	-	-	205	205	109	100	46.8	112	68	-	-	-	250	250	570	590	390	475	-	-	-	7.09	7.11	7.22	7.26
62	GK	894755	5.2	-	-	-	-	-	-	198	198	72	85	63.6	-	-	-	-	-	300	300	400	-	-	-	-	-	-	7.22	7.24	7.28	-
63	BK	811581	8.4	7.4	5.2	6.6	4	-	-	112	140	65	124	53.6	98	114	96	-	-	350	350	400	450	650	400	575	-	-	7.15	7.15	7.16	7.88
64	KK	506487	9.8	6.3	4.4	4.5	2.8	1.2	-	194	174	65	110	62.6	90	75	44	36	-	800	700	1300	1800	2150	2200	2600	2950	-	7.01	7.1	7.32	7.32
65	SD	973406	5.2	4.5	5	4	1.4	1	-	265	300	154	92	48.7	44	64	45	46	-	200	200	600	1800	2600	2200	4200	4500	-	7.04	7.14	7.34	7.45
66	RK	882132	7.4	7.2	6.9	5.8	1.8	1.1	-	203	203	74	70	63.5	101	75	34	43	-	700	600	300	350	375	350	700	600	-	7.11	7.11	7.19	7.46

Serial no.	Name	MRD	Ph_day 7	Ph_day 10	Ph_day 14	Ph_day 30	Lactate	Lactate_ day 0	Lactate_d ay 1	Lactate_d ay 3	Lactate_d ay 5	Lactate_d ay 7	Lactate_d ay 10	Lactate_d ay 14	Lactate_d ay 30	S HCO3	S HCO3_day 0	S HCO3_da y 1	S HCO3_da y 3	S HCO3_da y 5	S HCO3_da y 7	S HCO3_da y 10	S HCO3_da y 14	S HCO3_da y 30	HR	HR_day 0	HR_day 1	HR_day 3	HR_day 5	HR_day 7	HR_day 10	HR_day 14
1	LS	792712	7.3	7.32	-	-	-	7	7.9	2.4	4.2	2.3	4.4	-	-	-	8	9.8	11	17	14.9	10	-	-	-	120	128	126	130	132	100	-
2	SS	807239	-	-	-	-	-	7.8	7	2.5	-	-	-	-	-	-	8.5	8.5	15.9	-	-	-	-	-	-	134	120	116	-	-	-	-
3	BS	921738	7.3	7.31	7.32	-	-	7	7.7	3.4	5.3	4.4	2.2	2	-	-	11	10	15.8	17.5	12	8.18	16	-	-	134	122	122	130	110	102	104
4	HR	973360	7.42	7.38	7.32	7.3	-	3	3.2	2.4	1	2.6	1	0.8	1	-	13	14	18.4	20.1	21	18.2	16.9	20.2	-	112	100	86	96	98	100	88
5	JK	977185	7.44	7.32	7.28	7.32	-	8.4	8	3.2	3	2.6	2.9	1.9	1.6	-	10	11	16.9	21.7	22.2	21.1	16.4	22.6	-	110	101	92	86	92	88	86
6	LB	924486	7.21	7.28	7.37	7.29	-	4	3.5	5.1	4.4	2	2	1.5	1.2	-	13	13	19.2	22.1	15	15	16.2	22.2	-	106	96	94	104	98	102	96
7	MB	447628	7.33	7.45	7.4	-	-	7	6.2	3	2	1	1.1	0.7	0.4	-	10	11	16.5	19	19	20	22	20	-	110	102	94	104	94	96	94
8	SK	938771	-	-	-	-	-	6.7	5.2	9.4	-	-	-	-	-	-	8	10.5	9.1	-	-	-	-	-	-	130	122	122	-	-	-	-
9	AS	801216	7.48	7.44	7.34	-	-	6	6.6	2.3	2.4	2	2.5	1.2	-	-	9.5	9.5	14.3	18.6	13.6	15.9	16	-	-	130	118	102	128	98	88	90
10	YS	917434	7.3	7.31	7.33	7.4	-	4	4.8	5.3	3.5	2.3	1.9	2.4	3.2	-	9.6	10	16.9	11.9	12	11	10	14	-	120	109	110	132	130	112	112
11	MR	702786	7.3	7.33	7.35	7.38	-	6.8	6	4.5	3.2	2.4	2.1	1.2	0.8	-	11	11	19.5	18.3	22	21.1	24.9	21	-	118	110	110	112	102	92	90
12	SS	873501	7.25	7.24	7.37	7.29	-	4	5.6	6.5	7.7	3	2.4	1.6	1.2	-	9	11	20	18.8	22.1	15	20	22	-	130	128	136	136	100	98	88
13	CL	923806	7.41	7.33	7.34	-	-	5	5.3	6	1	2	1	2	1	-	11.4	11.4	17	21	18	23	18	23	-	108	96	96	100	86	88	92
14	SS	468714	7.44	7.36	7.35	7.35	-	7	6	4	3	3.1	2	2.1	1.5	-	9	11	16	19	18	21	23	19.4	-	100	92	92	108	98	94	92
15	GS	800079	7.41	7.33	7.34	-	-	7.4	7	1.9	2	1.9	2	3	-	-	8	8.8	18.3	16.9	10.2	18.6	17	-	-	138	126	104	98	112	102	110
16	JR	373727	7.32	7.27	7.34	7.33	-	4	4.8	5.3	3.5	2	1.5	1.6	1	-	8	8.8	14.3	15.9	10.2	13.6	24.3	22	-	111	90	91	89	101	98	97
17	JB	676457	-	-	-	-	-	4.2	4	2.2	4.3	-	-	-	-	-	8	10	12.5	18.3	-	-	-	-	-	140	132	132	100	-	-	-
18	TR	947518	-	-	-	-	-	7.4	8	2.3	-	-	-	-	-	-	8.3	9	11.5	-	-	-	-	-	-	130	122	120	-	-	-	-
19	SS	710888	7.31	7.43	-	-	-	10.5	11	4.3	2.3	1.8	1.4	-	-	-	8.8	9	18.3	16.9	10.2	18.6	-	-	-	112	126	116	130	126	142	-
20	TS	249300	7.44	7.35	7.34	7.28	-	4	3	2	1.9	1.3	1	1.1	0.8	-	8	9.8	17	18	17	20	20	21	-	107	98	90	100	94	92	96
21	BK	249918	7.42	7.23	-	-	-	2.9	3	2	1.9	1	1.8	-	-	-	11.5	11.5	18.3	26.5	20.5	15.8	-	-	-	121	114	112	118	98	100	-
22	NK	882105	7.26	7.3	-	-	-	4.4	4.4	1.7	2	1.8	2	-	-	-	14	14.3	18.2	20.2	18.8	19	-	-	-	133	124	122	119	78	96	-
23	AS	939682	-	-	-	-	-	8.2	8.4	2.5	-	-	-	-	-	-	14	8	13.8	-	-	-	-	-	-	138	128	125	-	-	-	-
24	GS	4470	7.38	7.33	7.44	-	-	5.8	5	4.8	1.9	2	2.3	-	-	-	10	10.9	14.9	18.7	22.2	18	17	-	-	120	125	120	120	122	100	90
25	AS	945030	7.31	7.33	-	-	-	12.4	12	8	6	8.2	3.1	-	-	-	12.5	10	11.5	10.4	9.1	9.3	8.6	-	-	134	124	122	96	98	111	-
26	VK	453002	7.34	7.31	-	-	-	4	4.2	4	3.2	4	4	-	-	-	9	10	17.3	16	16	16	-	-	-	130	120	112	124	89	98	-
27	G	543717	7.25	7.26	7.35	7.29	-	4	5.4	5	3	2.6	1	1	0.7	-	10	13	19.4	21.5	22	19.5	21	20	-	107	102	106	108	96	94	90
28	HS	934823	7.36	7.32	7.31	-	-	14.6	4.2	2.4	3.8	2	1.4	1.5	1.2	-	9	11	19.9	17	22	23	22	21	-	104	94	94	104	100	98	96
29	KK	931388	7.37	7.35	7.39	-	-	8.6	8.7	4.1	1.8	1.8	1.2	1.6	0.8	-	9.5	10.5	20	17	19	18.6	19.4	21	-	114	104	102	112	110	104	106
30	KS	788400	-	-	-	-	-	7	7.9	-	-	-	-	-	-	-	6	8	-	-	-	-	-	-	-	130	122	-	-	-	-	-
31	CS	479558	7.31	7.33	7.33	7.38	-	8.2	7	3.2	1.4	1	1.3	1.4	0.3	-	9	8.9	14	15	17	18	20	25	-	109	112	110	110	102	98	90
32	JK	159326	7.36	7.46	7.33	7.45	-	9	9.1	4	3	1	2	1.6	1.1	-	9	8.9	19	20	18	20	18	22	-	121	110	108	108	98	94	80
33	WM	686761	7.42	7.38	7.32	-	-	9.6	4.5	2.4	1.7	2.4	1.6	1.3	1	-	10	11	16	20	23	16	25.8	21	-	110	100	86	96	98	100	88
34	SC	162101	7.23	7.25	-	-	-	8.7	8	3.5	3.2	3.4	3.2	-	-	-	9	9.8	11	15.9	11.5	18.9	-	-	-	120	116	120	90	98	100	-
35	MS	964206	7.34	7.36	7.35	7.45	-	5.3	5	4.8	3.2	2.1	1.9	1.6	1.2	-	10	10.5	14	18.6	20	23.6	21.4	20.2	-	100	88	88	94	92	90	92
36	MBS	925970	7.42	7.44	7.39	7.28	-	7	11	3	1	1	0.9	1.2	1.2	-	5.6	6.6	16.7	15.8	19.5	18	17.9	21	-	106	102	98	106	98	94	86
37	SS	937686	7.29	7.3	7.31	7.35	-	3.3	3	2.2	1.9	1.4	1.6	1.2	1.1	-	11	11.5	15	18.6	14.6	15.9	17.5	20.5	-	115	104	104	110	108	110	102
38	HS	921055	7.24	7.24	-	-	-	4.2	4	4.8	3.2	2	2.3	-	-	-	9	9.3	17.2	20.2	14.4	12.5	-	-	-	126	124	122	124	113	110	-
39	RB	904184	7.33	7.35	7.39	7.36	-	9	9.4	4.6	3.6	2.4	1.5	1	0.5	-	10	11	17	15.9	18	18.3	17.5	19	-	110	100	94	104	98	96	94
40	HS	934418	7.39	7.34	7.35	-	-	8	7.9	2.4	1.9	2.1	0.9	2	0.6	-	9	11	14.7	17	15.2	22.5	23	21	-	108	98	94	104	110	100	98
41	SS	422332	7.13	7.26	7.4	-	-	6	5	5.3	3	4	5	4	-	-	10.3	10.3	16.9	12.2	14	18	17	-	-	140	130	124	110	88	96	88
42	KK	23530	7.31	7.33	7.44	-	-	4	4.8	2.5	1.9	2.5	1.9	2	-	-	6	7	11.5	15.9	21.9	13.2	15	-	-	130	124	122	128	110	110	100
43	AS	946902	7.33	7.35	7.34	7.46	-	9	9.1	3.5	3	2.7	2.5	1.6	1.1	-	8	8.9	19	20	18	21	18	21.1	-	98	94	94	98	96	92	88
44	DRS	764260	7.35	7.31	7.34	-	-	8.4	8	3.2	3	4.5	1.9	2	-	-	10	11	17	22.5	16.3	19.5	8	-	-	123	114	118	120	120	98	110
45	DK	921413	7.35	7.38	7.37	7.34	-	5.6	5	2.5	1.9	0.9	1.6	0.6	0.9	-	8	8.3	14	15.2	18	20.5	18	21.2	-	113	104	104	108	98	90	88
46	IK	625773	7.48	7.34	7.3	-	-	7	7.9	2.3	4	3.4	2.5	2.3	-	-	10.9	11	14.3	18.6	18.6	15.9	16	-	-	140	128	118	126	100	105	98
47	VKM	32394	7.26	7.38	7.45	-	-	6.5	6	3.2	3.2	1.8	2	2	-	-	13	14	18.2	18.2	28.8	18	16	-	-	120	128	122	130	98	98	90
48	RKJ	42767	7.3	7.32	7.38	7.35	-	3	3.5	4.7	3.4	2	1.5	1.6	1.2	-	9	9.2	15.4	18.2	22.5	18.5	22	22.5	-	96	86	86	92	94	90	88
49	RK	963889	7.44	7.31	-	-	-	5	4.7	3	2	2.4	2	-	-	-	10.2	11	16.5	18.2	18.6	18.3	-	-	-	129	136	122	124	98	102	-
50	KS	782645	7.27	7.29	7.31	-	-	9	9.4	8.7	5.6	4.5	4.4	-	-	-	6	6.7	16.2	18.7	12	10	-	-	-	128	124	124	120	102	100	-
51	MK	780420	7.34	7.28	-	-	-	6	6.5	1.9	3.2	2.3	1.9	-	-	-	8	10	9.8	10.9	15.9	18.3	-	-	-	130	122	122	94	100	98	-
52	SG	939363	7.26	-	-	-	-	11	6.9	4.2	4	8.2	-	-	-	-	13.8	12	9.7	12	10.7	-	-	-	-	130	122	122	128	105	-	-
53	BS	550977	7.35	7.34	7.35	7.29	-	5	5.3	6.2	1.5	2	1.3	1.2	0.6	-	10	10.8	19	18.8	17.5	22.5	22.4	19	-	108	96	94	104	104	100	98
54	ND	441156	7.32	7.36	7.35	7.29	-	3	3.4	2	1.8	1	1.4	0.8	0.6	-	9	11	17	18.2	19	20.3	20	19.9	-	116	104	108	112	100	98	90
55	KM	942047	-	-	-	-	-	8	6.4	3	-	-	-	-	-	-	9.7	8.8	10.7	-	-	-	-	-	-	120	128	126	-	-	-	-
56	MR	449952	7.35	7.36	7.39	7.35	-	8	7	4.6	2	2.4	1	1	0.5	-	9	11	18	15	17.9	19	18	20	-	102	92	88	92	86	90	88
57	HK	815312	7.29	7.41	-	-	-	6.3	6.3	3.2	3.3	2.3	1.8	-	-	-	17	18.3	16.9	20.2	16.5	9.4	-	-	-	116	106	104	100	98	90	-
58	HS	938365	7.32	7.35	7.18	-	-	5	4.3	5.5	4	3.1	3.2	2.2	3	-	13.3	14	10.4	14	16	13	-	-	-	130	126	124	102	98	114	-
59	GS	767117	7.36	7.36	7.35	7.45	-	3.4	3	2.2	1.8	1.6	1.4	0.8	0.6	-	10	11	17	18.2	17.6	20.3	19.5	21	-	114	114	112	112	102	98	84
60	SK	425055	7.42	7.34	7.3	7.26	-	9.4	9	3.7	3.4	2.9	2	1.6	1.8	-	10.5	10.5	21.3	18.8	22.1	15.8	20	23.2	-	112	102	90	96	90	86	100
61	DK	775795	7.35	7.29	-	-	-	3.3	3	5.1	4	4	4.4	-	-	-	8	8.9	15	18	12.6	19.9	-	-	-	132	124	124	130	122	111	-
62	GK	894755	-	-	-	-	-	9.6	9	3	-	-	-	-	-	-	10	11	18.6	-	-	-	-	-	-	134	124	106	-	-	-	-
63	BK	811581	7.23	7.44	7.32	-	-	7	7	2.5	2	1.4	1.9	2	-	-	10.5	11	18.3	25.8	19.4	22.2	19.4	-	-	128	118	124	110	98	112	110
64	KK	506487	7.25	7.23	7.35	7.38	-	4	3	3	2	2	1.8	1.2	0.7	-	11	12.9	15.9	18.4	19	20	21	18	-	105	120	108	112	104	102	100
65	SD	973406	7.35	7.34	7.29	7.45	-	8	8.7	3.5	1.9	1.4	1.2	1.4	1.5	-	10	10	19.4	21.1	18.8	18.2	21.5	22	-	112	92	96	98	86	84	92
66	RK	882132	7.31	7.24	7.37	7.29	-	7	7.7	8.4	5.3	2.4	3.4	0.8	1.2	-	11	11	16.9	21.7	21	22	19	21	-	120	116	124	124	111	100	88

Serial no.	Name	MRD	HR_day 30	MAP	MAP_day 0	MAP_day 1	MAP_day 3	MAP_day 5	MAP_day 7	MAP_day 10	MAP_day 14	MAP_day 30	CVP	CVP_day 0	CVP_day 1	CVP_day 3	CVP_day 5	CVP_day 7	CVP_day 10	CVP_day 14	CVP_day 30	s. K	S.K_day 0	S.K_day 1	S.K_day 3	S.K_day 5	S.K_day 7	S.K_day 10	S.K_day 14	S.K_day 30	Need for mechanical ventilation.	Total days on mechanical ventilation
1	LS	792712	-	-	61	60	62	63	62	72	-	-	-	16	15	14	13	10	8	-	-	-	6	6.4	5.9	4.8	4.3	3.9	-	-	Yes	8
2	SS	807239	-	-	58	71	62	-	-	-	-	-	-	15	15	12	-	-	-	-	-	-	5.9	6.4	4	-	-	-	-	-	Yes	7
3	BS	921738	-	-	63	64	65	65	64	62	78	-	-	14	14	12	10	9	7	8	-	-	6	5.8	5	4.8	4.3	4.1	-	-	No	-
4	HR	973360	84	-	70	71	68	66	80	78	80	78	-	11	10	12	14	12	10	8	-	-	5	5.4	4.5	3.9	4.5	3.8	5.1	3.8	Yes	9
5	JK	977185	96	-	70	74	58	76	64	70	76	70	-	15	15	12	12	10	10	11	-	-	6.2	6	4	3.8	4	4.9	5.2	3.6	Yes	8
6	LB	924486	92	-	63	63	76	75	70	60	72	88	-	9	8	7	8	9	7	9	-	-	7.7	7.7	4.9	3.4	4.4	3.8	3.8	3.5	Yes	4
7	MB	447628	88	-	70	63	65	67	64	71	65	80	-	11	11	8	9	7	10	9	-	-	5.5	6	4.3	4.1	3.9	3.9	3.4	3.8	No	-
8	SK	938771	-	-	65	70	62	-	-	-	-	-	-	14	15	13	-	-	-	-	-	-	5.4	5.9	5.2	-	-	-	-	-	No	-
9	AS	801216	-	-	70	80	74	64	70	63	78	-	-	11	11	9	7	5	6	4	-	-	5.9	6	5	5.1	4.6	4	3.5	-	No	-
10	YS	917434	102	-	59	58	60	60	65	64	62	78	-	16	16	14	13	11	7	9	9	-	7	7.1	5.5	5.54	4.9	4.2	4	4.2	No	-
11	MR	702786	90	-	60	68	70	68	70	64	62	72	-	13	12	10	10	9	7	5	-	-	5.6	6	4.8	3.6	3.8	3.9	4	4.2	No	-
12	SS	873501	90	-	67	68	62	71	74	80	72	82	-	12	12	10	8	6	6	5	-	-	6.9	6	3.6	4.9	3.4	4.2	5.4	3.5	No	-
13	CL	923806	82	-	64	74	66	73	69	66	76	73	-	14	14	10	11	14	12	10	-	-	6	5.9	3.4	3.8	3.9	4	4.5	4.6	Yes	4
14	SS	468714	90	-	69	68	73	74	74	80	72	82	-	14	14	11	10	8	9	7	-	-	6	5.5	3.8	5.4	3.4	4.5	3.8	3.9	No	-
15	GS	800079	-	-	64	66	64	68	67	65	85	-	-	12	12	10	8	6	5	6	-	-	6	5.9	4.5	4	5.8	4	3	-	Yes	5
16	JR	373727	100	-	68	66	68	66	70	66	75	74	-	9	8	12	10	10	89	10	-	-	7	6.4	4	3	5.2	4.3	3.4	4	Yes	7
17	JB	676457	-	-	60	59	61	60	-	-	-	-	-	16	16	15	14	-	-	-	-	-	7.3	7	5	5.3	-	-	-	-	Yes	5
18	TR	947518	-	-	72	73	74	-	-	-	-	-	-	14	13	11	-	-	-	-	-	-	6.8	6	4.6	-	-	-	-	-	Yes	7
19	SS	710888	-	-	64	66	64	64	63	66	-	-	-	16	16	14	12	10	9	-	-	-	7.6	6	4.2	4	3.6	3.5	-	-	Yes	5
20	TS	249300	90	-	65	72	66	70	60	69	71	64	-	14	14	11	10	11	8	7	-	-	6	6.5	4.5	4.8	3.5	4.4	3.4	3.5	No	-
21	BK	249918	-	-	61	63	65	74	65	61	-	-	-	12	11	10	10	8	7	-	-	-	6	5.9	4.3	3.4	3	4	-	-	Yes	8
22	NK	882105	-	-	70	72	66	82	63	86	-	-	-	19	18	16	14	12	9	8	-	-	6.3	6	4.2	5.3	3.5	5.1	4	-	No	-
23	AS	939682	-	-	62	64	64	-	-	-	-	-	-	12	12	10	-	-	-	-	-	-	6	6.2	4.9	-	-	-	-	-	No	-
24	GS	4470	-	-	66	67	64	70	68	78	80	-	-	15	15	12	10	8	8	9	-	-	4.9	5	4.5	4.3	4.4	3.6	4	-	No	-
25	AS	945030	-	-	63	63	65	64	68	65	-	-	-	16	16	14	12	10	8	-	-	-	5.4	7.1	5.3	4.5	3.9	3.2	-	-	Yes	10
26	VK	453002	-	-	63	64	65	65	80	76	-	-	-	15	15	13	11	8	8	-	-	-	6	6.2	4.8	4.6	4	3.4	-	-	Yes	8
27	G	543717	92	-	73	71	72	66	73	74	74	75	-	12	11	10	9	8	10	7	-	-	6	5.9	4.5	4.8	3.9	5.6	4.8	4.6	No	-
28	HS	934823	94	-	65	75	68	69	70	60	78	80	-	9	9	12	10	9	7	6	-	-	4.5	7.1	4.1	3.9	3.8	3.7	3.6	3.5	Yes	8
29	KK	931388	98	-	62	67	66	75	68	78	88	78	-	11	11	10	11	9	8	9	-	-	5.2	6.1	4.2	3.8	4.2	4.1	4.2	4.5	No	-
30	KS	788400	-	-	60	60	-	-	-	-	-	-	-	16	15	-	-	-	-	-	-	-	6	6.4	-	-	-	-	-	-	Yes	1
31	CS	479558	94	-	67	68	70	72	69	64	66	72	-	12	11	10	12	10	11	9	-	-	6	6.5	3.9	4.1	3.6	3.9	3.4	4.2	No	-
32	JK	159326	82	-	61	61	60	69	64	70	75	66	-	12	12	11	10	9	7	9	-	-	7	7.5	5.2	6.2	4.6	4.7	5.2	3.8	No	-
33	WM	686761	84	-	66	72	70	74	74	70	80	84	-	15	14	11	14	12	10	8	-	-	5.9	5.9	4.6	5.9	4.5	5.7	5.1	3.8	Yes	9
34	SC	162101	-	-	55	58	60	62	62	61	-	-	-	14	13	10	9	9	8	-	-	-	7	6	5.4	4.9	4.2	4.1	-	-	Yes	8
35	MS	964206	88	-	70	88	76	82	75	80	78	82	-	12	12	11	9	8	8	8	-	-	5	4.9	4	3.6	3.4	3.7	3.8	4	No	-
36	MBS	925970	82	-	66	70	84	68	71	66	76	70	-	12	12	10	9	7	8	6	-	-	5.9	6	4.1	3.1	3.8	4.4	3.9	4	Yes	7
37	SS	937686	98	-	70	80	66	65	68	62	70	78	-	9	8	9	8	9	10	11	-	-	5.6	6	4.9	4.8	3.7	3.6	3.8	3.6	Yes	5
38	HS	921055	-	-	59	60	62	64	60	88	-	-	-	14	14	10	9	7	8	-	-	-	6.4	7	5.4	5	4.1	4	-	-	No	-
39	RB	904184	92	-	68	69	65	67	64	71	61	78	-	10	9	8	7	7	8	8	-	-	5.9	5.9	5	4.5	4	3.9	3.7	3.8	No	-
40	HS	934418	86	-	66	67	68	78	71	68	75	70	-	14	13	9	8	9	8	6	-	-	5.8	5.8	3.8	4.3	3.9	3.6	3.5	3.5	No	-
41	SS	422332	-	-	66	72	74	60	84	58	88	-	-	13	14	12	9	7	8	9	-	-	6	6.9	4.5	4.54	5	5.5	4	-	Yes	5
42	KK	23530	-	-	62	63	65	65	64	61	78	-	-	19	16	14	12	10	8	8	-	-	5.6	5.7	5	4.5	3.9	3.2	4.4	-	Yes	9
43	AS	946902	86	-	60	62	58	69	64	64	68	64	-	12	11	10	9	8	7	6	-	-	5.2	5	5	4.2	3.3	3.4	3.5	3.5	No	-
44	DRS	764260	-	-	63	63	64	64	65	61	78	-	-	14	14	12	11	9	7	5	-	-	5.4	5.5	4.9	4.6	4	3.9	3.6	-	Yes	10
45	DK	921413	90	-	64	74	68	60	68	71	76	82	-	11	12	11	10	11	8	6	-	-	7.2	7	5.5	3.2	4.8	4.6	4.2	4	Yes	6
46	IK	625773	-	-	64	63	64	64	63	61	68	-	-	13	13	11	9	7	6	-	-	-	6	5.9	5	5.1	4.6	4	4	-	No	-
47	VKM	32394	-	-	63	63	64	64	63	78	80	-	-	15	16	14	12	10	8	9	-	-	5.4	5.5	5.2	4.2	3.5	3	4.3	-	Yes	10
48	RKJ	42767	84	-	64	66	78	76	76	66	68	86	-	9	9	10	11	10	12	-	-	-	8	7.5	4	3.2	4.4	4.5	4.8	3.5	Yes	5
49	RK	963889	-	-	65	63	63	70	66	64	-	-	-	14	14	13	10	8	7	7	-	-	6.7	6	5.3	5.4	5.9	3.8	4	-	Yes	8
50	KS	782645	-	-	59	59	60	62	76	78	-	-	-	14	14	11	9	8	9	-	-	-	5	5.9	4.9	4.5	3.5	3.5	-	-	Yes	7
51	MK	780420	-	-	61	61	63	64	61	60	-	-	-	14	14	12	10	9	6	-	-	-	6	6.2	4.3	4.7	3.6	3.4	-	-	Yes	6
52	SG	939363	-	-	61	61	63	64	61	-	-	-	-	14	14	12	10	9	-	-	-	-	6	7.1	5.3	4.7	3.6	-	-	-	Yes	8
53	BS	550977	86	-	62	74	68	72	71	76	71	76	-	11	10	9	8	9	8	6	-	-	5.8	5.8	4.9	4.5	3.9	3.6	3.5	3.5	No	-
54	ND	441156	86	-	64	62	65	66	75	60	70	73	-	12	12	10	8	7	6	5	-	-	6.8	6	5	5	4.5	3.5	4.6	3.6	No	-
55	KM	942047	-	-	61	60	62	-	-	-	-	-	-	15	15	14	-	-	-	-	-	-	6	6.3	5.9	-	-	-	-	-	No	-
56	MR	449952	92	-	74	69	64	68	66	75	72	85	-	10	9	7	8	6	8	6	-	-	6.5	6	4.3	3.5	4.5	3.8	4.1	4.2	No	-
57	HK	815312	-	-	68	81	61	62	61	62	-	-	-	16	17	14	13	15	11	-	-	-	5.8	6	4.6	4.9	3.2	4.1	-	-	No	-
58	HS	938365	-	-	61	61	62	78	84	76	68	-	-	9	14	11	10	8	6	8	-	-	6.2	5.5	5.9	5.4	4.7	4.3	4.4	-	Yes	9
59	GS	767117	78	-	58	61	65	63	64	70	74	66	-	10	10	9	8	7	7	7	-	-	7	6.5	4.9	4.2	3.8	3.7	4.8	3.8	No	-
60	SK	425055	96	-	60	62	74	78	70	68	80	84	-	12	12	10	12	9	12	9	-	-	7.2	7	3.9	4	4.6	5.1	4.8	5.1	Yes	6
61	DK	775795	-	-	60	60	61	62	61	61	-	-	-	15	15	13	10	10	8	-	-	-	6.5	6	4.8	5.2	4.8	4.5	-	-	Yes	10
62	GK	894755	-	-	59	60	63	-	-	-	-	-	-	15	15	13	-	-	-	-	-	-	6.7	6	5.6	-	-	-	-	-	No	-
63	BK	811581	-	-	67	82	66	65	65	76	72	-	-	16	16	15	14	11	10	8	-	-	9	7	5.6	6.5	3.8	4.5	3.3	4	No	-
64	KK	506487	96	-	70	64	63	66	69	70	69	68	-	13	13	12	11	10	9	6	-	-	5.9	6	5.4	4.2	4.2	4.2	5.4	3.6	No	-
65	SD	973406	86	-	66	68	68	80	70	68	75	70	-	12	12	8	9	12	10	8	-	-	5	4.5	4.2	3	4	3.6	4.5	5	Yes	5
66	RK	882132	80	-	70	72	72	74	67	60	80	78	-	12	12	14	12	11	9	9	-	-	7.2	7	4.2	5.4	4.8	4.4	4.3	4.2	No	-

Serial no.	Name	MRD	Total days on vasopressors	Cumulative vasopressor dose	Norepinephrine (mcg/min)	Vasopressin (cumulative units)	Dobutamine in grams	Death	ICU type medical-surgical-, cardiovascular /CCU	Survival at 14 days after RRT	14 day mortality rate	14 day mortality rate after RRT	30 day mortality rate	All cause intra hospital mortality rate (last contact)	Days until death	days until discharge	duration of CRRT in hours	Days on RRT (duration of RRT)	Dailysis free days	30 day RRT dependence	RRT switch	RRT Switch to	Serum creat at discharge/last contact in survivors; mg/dl)	Total UF (ML)	Anticoagulation
1	LS	792712	8	-	510	-	3.8	Yes	1	No	Yes	Yes	Yes	Yes	10	-	130	6	4	-	2	-	-	9000	0
2	SS	807239	7	-	620	-	-	Yes	2	No	Yes	Yes	Yes	Yes	2	-	-	1	1	-	2	-	-	5700	1
3	BS	921738	9	-	550	-	4.4	Yes	2	No	No	Yes	Yes	Yes	15	-	48	2	13	-	1	2	-	6800	1
4	HR	973360	6	-	500	-	-	No	1	Yes	No	No	No	No	-	18	46	2	16	2	2	-	3.5	8000	1
5	JK	977185	7	-	650	115	-	No	1	Yes	No	No	No	No	-	24	48	2	22	1	1	2	5.2	4000	1
6	LB	924486	6	-	390	-	-	No	1	Yes	No	No	No	No	-	30	-	6	24	2	2	-	3	8900	1
7	MB	447628	6	-	280	-	-	No	1	Yes	No	No	No	No	-	20	-	5	15	2	2	-	0.9	6800	1
8	SK	938771	4	-	790	340	5.9	Yes	1	No	Yes	Yes	Yes	Yes	4	-	56	2	-	-	2	-	-	8400	1
9	AS	801216	13	-	690	-	-	Yes	2	No	No	Yes	Yes	Yes	21	-	-	7	14	-	2	-	-	8700	1
10	YS	917434	9	-	590	360	-	Yes	2	No	No	Yes	Yes	Yes	25	-	120	5	20	-	2	-	-	8000	1
11	MR	702786	4	-	450	-	-	No	2	Yes	No	No	No	No	-	24	126	5	19	2	2	-	1.4	9000	1
12	SS	873501	5	-	560	300	-	Yes	1	Yes	No	No	No	No	-	16	-	3	4	2	2	-	1.3	11000	2
13	CL	923806	4	-	490	-	3.4	No	1	Yes	No	No	No	No	-	27	-	8	19	2	2	-	1	1000	2
14	SS	468714	4	-	490	-	-	No	2	Yes	No	No	No	No	-	19	-	7	14	2	2	-	1.2	10000	2
15	GS	800079	12	-	670	280	-	Yes	1	No	No	Yes	Yes	Yes	17	-	-	5	12	-	2	-	-	9000	2
16	JR	373727	4	-	580	-	5.1	No	1	Yes	No	No	No	No	-	19	90	4	17	2	2	-	4.6	7000	2
17	JB	676457	5	-	860	-	-	Yes	1	No	Yes	Yes	Yes	Yes	5	-	78	3	2	-	2	-	-	11000	2
18	TR	947518	7	-	390	-	-	Yes	1	No	Yes	Yes	Yes	Yes	2	-	-	1	5	-	2	-	-	9000	2
19	SS	710888	12	-	680	-	-	Yes	1	No	Yes	Yes	Yes	Yes	14	-	-	5	9	-	2	-	-	2000	2
20	TS	249300	5	-	430	-	-	No	1	Yes	No	No	No	No	-	18	-	5	13	2	1	1	1.1	11000	2
21	BK	249918	10	-	490	-	-	Yes	1	No	Yes	Yes	Yes	Yes	13	-	-	4	7	-	1	3	-	9000	2
22	NK	882105	10	-	570	-	-	Yes	1	No	Yes	Yes	Yes	Yes	13	-	-	5	9	-	2	-	-	3000	2
23	AS	939682	3	-	390	280	-	Yes	1	No	Yes	Yes	Yes	Yes	3	-	40	2	-	-	1	1	-	6000	2
24	GS	4470	12	-	625	-	1.7	Yes	1	No	No	Yes	Yes	Yes	19	-	-	4	15	-	2	-	-	7000	2
25	AS	945030	12	-	690	250	-	Yes	1	No	Yes	Yes	Yes	Yes	12	-	76	3	-	-	2	-	-	12000	2
26	VK	453002	9	-	475	-	-	Yes	1	No	Yes	Yes	Yes	Yes	10	-	72	3	7	-	2	-	-	1500	2
27	G	543717	6	-	230	-	-	No	2	Yes	No	No	No	No	-	20	-	6	14	2	2	-	0.8	8000	2
28	HS	934823	10	-	400	-	-	No	1	Yes	No	No	No	No	-	16	76	3	15	2	2	-	0.8	9000	2
29	KK	931388	7	-	490	240	-	No	1	Yes	No	No	No	No	-	16	72	4	11	2	2	-	0.8	6000	2
30	KS	788400	1	-	450	160	-	Yes	1	No	Yes	Yes	Yes	Yes	1	-	16	1	8	-	1	3	-	9000	2
31	CS	479558	4	-	570	-	-	No	2	Yes	No	No	No	No	-	24	-	7	16	2	2	-	1.4	10000	2
32	JK	159326	5	-	610	280	-	No	2	Yes	No	No	No	No	-	18	-	5	13	2	2	-	0.8	11000	2
33	WM	686761	6	-	480	390	-	No	1	Yes	No	No	No	No	-	17	72	4	13	2	1	2	3	5000	2
34	SC	162101	10	-	650	345	5.1	Yes	1	No	Yes	Yes	Yes	Yes	10	-	124	5	5	-	2	-	-	1500	2
35	MS	964206	4	-	400	-	-	No	2	Yes	No	No	No	No	-	19	90	3	16	1	2	-	3.9	12000	2
36	MBS	925970	8	-	350	-	-	No	1	Yes	No	No	No	No	-	12	-	4	8	2	2	-	1.2	8000	2
37	SS	937686	5	-	650	345	-	No	1	Yes	No	No	No	No	-	22	78	4	18	2	1	2	1.4	11000	2
38	HS	921055	10	-	675	-	-	Yes	2	No	Yes	Yes	Yes	Yes	10	-	46	2	8	-	1	2	-	9000	3
39	RB	904184	6	-	200	-	-	No	1	Yes	No	No	No	No	-	20	18	1	19	1	2	-	4.9	3000	3
40	HS	934418	5	-	700	-	-	No	1	Yes	No	No	No	No	-	10	82	3	7	2	2	-	1	9000	3
41	SS	422332	9	-	580	-	-	Yes	2	No	No	Yes	Yes	Yes	22	-	-	5	17	-	2	-	-	8000	1
42	KK	23530	12	-	740	-	-	Yes	1	No	No	Yes	Yes	Yes	17	-	72	4	13	-	1	3	-	7000	1
43	AS	946902	6	-	580	160	-	No	2	Yes	No	No	No	No	-	19	124	5	14	2	1	2	0.9	8000	1
44	DRS	764260	9	-	650	345	-	Yes	1	No	Yes	Yes	Yes	Yes	12	-	80	3	9	-	1	3	-	10000	1
45	DK	921413	4	-	750	230	-	No	1	Yes	No	No	Yes	Yes	-	18	24	1	17	2	2	-	1.4	11000	1
46	IK	625773	13	-	690	400	-	Yes	2	No	No	Yes	Yes	Yes	28	-	144	6	22	-	2	-	-	13000	1
47	VKM	32394	10	-	560	350	-	Yes	1	No	No	Yes	Yes	Yes	15	-	24	5	9	-	2	-	-	9500	1
48	RKJ	42767	5	-	250	-	-	No	1	Yes	No	No	No	No	-	14	72	3	13	1	2	-	3.5	7000	1
49	RK	963889	9	-	730	-	-	Yes	1	No	Yes	Yes	Yes	Yes	11	-	-	4	7	-	2	-	-	4000	1
50	KS	782645	11	-	725	-	-	Yes	1	No	Yes	Yes	Yes	Yes	12	-	78	3	9	-	2	-	-	1500	1
51	MK	780420	10	-	850	460	-	Yes	1	No	Yes	Yes	Yes	Yes	11	-	79	3	8	-	2	-	-	14000	1
52	SG	939363	8	-	880	-	-	Yes	1	No	Yes	Yes	Yes	Yes	8	-	126	5	-	-	2	-	-	10000	1
53	BS	550977	5	-	326	-	-	No	1	Yes	No	No	No	No	-	17	75	3	14	2	1	2	0.9	8700	1
54	ND	441156	4	-	300	-	-	No	2	Yes	No	No	No	No	-	17	-	8	9	2	2	-	1.4	11000	1
55	KM	942047	2	-	670	300	-	Yes	1	No	Yes	Yes	Yes	Yes	2	-	46	2	-	-	2	-	-	11000	1
56	MR	449952	4	-	470	-	-	No	1	Yes	No	No	No	No	-	18	-	5	13	2	1	1	1.1	11000	1
57	HK	815312	14	-	740	-	-	Yes	1	No	Yes	Yes	Yes	Yes	10	-	-	4	6	-	1	1	-	8000	1
58	HS	938365	10	-	800	400	6.5	Yes	1	No	No	Yes	Yes	Yes	17	-	120	5	-	-	2	-	-	11000	1
59	GS	767117	5	-	600	150	-	No	2	Yes	No	No	No	Yes	-	18	26	2	16	2	2	-	0.8	13000	1
60	SK	425055	8	-	650	-	-	No	1	Yes	No	No	No	No	-	29	66	3	26	1	1	2	6.1	11000	1
61	DK	775795	10	-	590	-	6	Yes	1	No	Yes	Yes	Yes	Yes	10	-	108	4	6	-	1	3	-	9500	1
62	GK	894755	2	-	800	-	-	Yes	2	No	Yes	Yes	Yes	Yes	2	-	42	2	7	-	2	-	-	3000	1
63	BK	811581	12	-	570	-	-	Yes	1	No	No	Yes	Yes	Yes	19	-	-	6	13	-	2	-	-	12000	1
64	KK	506487	3	-	580	230	-	No	1	Yes	No	No	No	No	-	19	-	6	13	2	2	-	1.2	11000	2
65	SD	973406	4	-	200	-	2	No	1	Yes	No	No	No	No	-	28	60	3	25	2	2	-	1	6000	2
66	RK	882132	10	-	570	-	-	Yes	1	Yes	No	No	No	Yes	-	18	-	5	13	2	2	-	1.4	7000	2

Serial no.	Name	MRD	Age	Gender	Group	Etiology of Aki	Category	Baseline Hb (g/dl)	Premorbid creatinine(mg/dl)	Hco3 baseline	Need for vasopressor	SBP	DBP	Reason for AKI	DM	HTN	COPD	CAD	CKD	CHF	Neurology/post stroke	Malignancy	Pancreatitis	Indication of dialysis	SOFA score_	SOFA score day 0	SOFA score day 1	SOFA score day 3	SOFA score day 5	SOFA score day 7	SOFA score day 10	SOFA score day 14	SOFA score day 30	s. Creat	s.Creat_day 0	s.Creat_day 1
67	RKA	920843	65	1	1	2	1	8.9	-	11	Yes	90	66	1	Absent	Absent	Absent	Present	Present	Absent	Absent	Absent	Absent	1	-	16	15	14	14	15	17	9	10	-	11.8	11
68	JS	806411	71	1	2	1	2	12.4	-	11	Yes	88	58	3	Present	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	15	14	14	14	14	12	12	-	-	7	6.9
69	PK	957243	78	1	2	11	1	11.2	2.5	14	Yes	90	68	2	Absent	Absent	Absent	Present	Present	Absent	Absent	Absent	Absent	4	-	16	16	15	14	13	14	-	-	-	8.3	8.3
70	SS	31929	54	1	2	1	1	10	-	12	Yes	90	60	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	16	15	15	9	9	-	-	-	-	11.2	12
71	KS	941424	65	1	3	6	1	10.2	-	12	Yes	88	66	1	Present	Absent	Present	Present	Absent	Absent	Absent	Absent	Absent	1	-	12	16	15	15	14	-	-	-	-	6.9	6.4
72	BL	184581	76	1	3	11	1	11.2	-	10	Yes	100	70	2	Present	Present	Absent	Present	Absent	Absent	Absent	Absent	Absent	3	-	18	18	15	10	9	9	7	5	-	8.1	8.3
73	BS	915489	65	1	1	1	1	10	-	13	Yes	86	64	1	Absent	Absent	Absent	Absent	Present	Absent	Present	Absent	Absent	2	-	15	14	14	15	12	10	9	-	-	9.9	9
74	KL	93934	45	1	1	3	1	9.5	-	10	Yes	100	64	1	Present	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	2	-	14	16	15	12	9	9	6	4	-	8.1	9
75	KS	791824	54	2	2	11	1	11	2	15	Yes	88	60	2	Absent	Absent	Absent	Present	Present	Absent	Absent	Absent	Absent	3	-	14	14	12	13	10	-	-	-	-	9	9
76	HS	918158	86	1	1	6	1	10.4	4.5	10	Yes	88	62	1	Absent	Absent	Present	Absent	Present	Absent	Absent	Absent	Absent	2	-	16	16	15	14	15	8	8	-	-	9.7	9
77	GS	796052	66	2	2	8	1	10	-	12	Yes	88	62	2	Present	Absent	Present	Absent	Present	Present	Absent	Absent	Absent	4	-	14	14	13	13	13	-	-	-	-	7.8	7.8
78	AS	969220	55	1	1	8	1	11.8	-	15	Yes	88	56	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	2	-	12	12	11	10	9	8	4	4	-	8.6	8.6
79	HK	935004	76	1	3	1	1	13	-	10	Yes	98	64	1	Present	Present	Present	Present	Absent	Absent	Absent	Absent	Absent	4	-	19	19	16	9	7	6	5	3	-	8	8.5
80	SS	958627	57	1	1	8	1	9.6	-	20	Yes	90	62	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	2	-	10	10	9	9	7	9	6	4	-	10	11
81	DC	952484	57	1	2	6	1	11.4	-	10	Yes	88	62	1	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	2	-	15	16	14	16	15	14	-	-	-	11	11
82	GS	449429	69	2	2	1	1	10.2	-	18	Yes	90	62	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	14	13	12	10	9	9	6	5	-	9.2	7.6
83	KR	268515	65	1	1	8	1	10.7	3.2	12	Yes	86	62	1	Present	Present	Present	Absent	Present	Absent	Absent	Absent	Absent	1	-	17	17	15	12	12	12	-	-	-	6.1	7
84	JK	952102	68	2	2	1	1	9	-	10	Yes	84	64	1	Present	Present	Present	Present	Absent	Absent	Absent	Absent	Absent	4	-	14	14	13	14	13	13	-	-	-	8.2	10
85	GS	714651	58	1	3	11	1	11.5	2	14	Yes	96	65	2	Present	Present	Absent	Present	Absent	Absent	Absent	Absent	Absent	3	-	15	15	13	12	6	5	6	4	-	6.9	6.9
86	NK	467971	56	1	2	1	2	9.6	-	14	Yes	88	50	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	13	13	11	11	9	6	7	5	-	10.8	11
87	MJ	949220	76	2	2	6	1	11	1.6	12	Yes	90	60	1	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Present	4	-	16	16	15	15	14	14	12	-	-	9.6	10
88	P	916639	56	2	2	6	1	9	-	15	Yes	96	62	1	Present	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	10	9	9	10	6	6	5	3	-	7.5	7.8
89	SKM	776651	66	1	1	11	1	9.9	-	13	Yes	92	64	2	Present	Present	Absent	Present	Present	Absent	Absent	Absent	Absent	3	-	17	16	15	16	18	14	-	-	-	9.4	10
90	JS	810544	55	1	2	1	1	12	-	8	Yes	90	62	1	Present	Absent	Absent	Present	Absent	Present	Present	Absent	Absent	3	-	12	11	9	8	8	5	8	-	-	8	8.9
91	R	921003	76	1	1	6	1	9	-	12	Yes	90	60	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	18	19	17	16	-	-	-	-	-	12.3	11
92	KD	802241	68	2	2	7	1	9.4	-	13	Yes	84	60	2	Absent	Absent	Absent	Absent	Absent	Absent	Present	Absent	Absent	4	-	15	15	15	14	13	-	-	-	-	8.6	8.6
93	HK	288463	64	2	1	11	1	8.4	1.9	15	Yes	90	65	2	Present	Present	Absent	Present	Present	Absent	Absent	Absent	Absent	4	-	15	15	15	16	18	-	-	-	-	7.6	8
94	BK	980590	56	1	1	11	1	10	-	15	Yes	96	62	2	Present	Present	Absent	Present	Absent	Absent	Absent	Absent	Absent	4	-	9	9	11	10	7	6	6	4	-	6.5	6.5
95	BS	801356	71	1	2	9	1	11.4	-	12	Yes	86	60	1	Present	Present	Absent	Absent	Absent	Absent	Absent	Present	Absent	4	-	16	15	12	11	-	-	-	-	-	8	8.5
96	RA	192383	47	2	2	8	1	11	-	8	Yes	106	88	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	2	-	12	12	11	8	9	9	8	4	-	7.5	10.2
97	JS	34271	60	2	2	1	1	8.5	2.6	14	Yes	100	62	1	Absent	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	4	-	10	11	10	10	7	4	4	4	-	8.8	8
98	GK	976872	54	2	1	11	1	11	3	7	Yes	90	62	2	Present	Present	Present	Present	Present	Absent	Present	Absent	Absent	3	-	15	15	11	10	6	4	5	4	-	8.2	8
99	HK	806097	65	1	2	3	1	7.4	-	15	Yes	90	60	1	Present	Present	Absent	Present	Absent	Absent	Absent	Absent	Absent	2	-	15	16	14	14	14	12	-	-	-	7	6.8
100	BB	937657	65	1	3	2	1	8.4	1.9	15	Yes	90	65	1	Absent	Absent	Absent	Absent	Present	Present	Present	Absent	Present	4	-	12	19	16	-	-	-	-	-	-	7	7.6
101	D	885321	58	2	2	5	1	10	-	12	Yes	92	66	1	Present	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	15	15	14	12	-	9	6	-	-	9	11
102	BK	811581	63	2	2	11	2	9.6	-	14	Yes	86	62	2	Present	Absent	Absent	Present	Present	Absent	Absent	Absent	Absent	2	-	15	15	12	15	12	12	12	-	-	8	7.9
103	JS	155951	74	2	2	1	1	11	-	13	Yes	92	64	1	Present	Present	Absent	Present	Present	Absent	Absent	Absent	Absent	3	-	14	14	14	12	13	12	-	-	-	10.4	12
104	NKT	953350	67	2	1	7	1	11	-	15	Yes	88	63	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	13	13	11	10	10	4	7	3	-	11	11
105	NK	941462	54	2	3	3	1	11	2.5	16	Yes	88	60	1	Present	Absent	Absent	Absent	Present	Absent	Absent	Absent	Absent	1	-	12	16	15	14	14	13	-	-	-	6	6.3
106	DS	267354	67	2	2	10	1	11.2	-	18	Yes	100	64	1	Absent	Absent	Absent	Absent	Absent	Absent	Present	Absent	Absent	3	-	12	12	9	0	9	6	4	3	-	12	9.8
107	SK	792283	54	2	2	11	1	10	3	7	Yes	90	62	2	Present	Present	Present	Present	Present	Absent	Present	Absent	Absent	3	-	14	13	11	5	7	5	4	3	-	10.1	5.9
108	M	922790	65	1	1	6	1	9.7	2.2	14	Yes	80	62	1	Present	Present	Absent	Present	Present	Absent	Absent	Absent	Present	4	-	15	17	14	14	16	8	10	-	-	7.8	8
109	MK	928552	57	1	2	11	1	11	-	7	Yes	96	61	2	Present	Present	Absent	Absent	Absent	Absent	Absent	Absent	Present	1	-	11	11	11	8	8	7	5	4	-	6.7	9.1
110	VK	941632	76	1	3	6	1	9.6	-	14	Yes	90	64	1	Present	Absent	Absent	Absent	Present	Absent	Absent	Absent	Absent	4	-	12	19	17	15	14	-	-	-	-	8	8.4
111	GS	481221	45	1	2	1	2	9.7	-	14	Yes	106	88	3	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Present	Absent	3	-	15	14	13	11	10	7	5	4	-	8.2	8.6
112	TD	962213	55	2	2	6	1	9.7	-	16	Yes	88	64	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	13	14	12	11	11	9	-	-	-	7.6	8
113	JS	773014	68	1	1	11	1	9.4	4	10	Yes	90	65	2	Present	Present	Absent	Present	Present	Absent	Absent	Absent	Absent	2	-	15	20	16	15	14	14	-	-	-	9.8	9.8
114	LS	792712	65	1	2	6	1	11	1.5	16	Yes	88	60	1	Absent	Absent	Present	Absent	Present	Absent	Absent	Absent	Absent	3	-	16	16	15	13	10	-	-	-	-	7.3	8
115	SK	803736	56	2	2	3	1	8.9	2.4	11	Yes	90	64	1	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	16	15	16	12	12	9	-	-	-	8.8	9
116	SN	565055	56	1	1	11	1	12	-	10	Yes	90	65	2	Present	Present	Absent	Present	Present	Absent	Absent	Absent	Absent	1	-	14	14	10	8	8	5	4	4	-	13	12
117	M	936343	59	1	3	1	1	7.6	-	14	Yes	88	56	1	Present	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	18	18	16	12	9	8	6	5	-	11	11.3
118	VK	922058	56	1	1	4	1	11	3.2	14	Yes	84	60	1	Present	Present	Present	Absent	Present	Absent	Absent	Absent	Absent	2	-	16	17	-	-	-	-	-	-	-	10.7	10
119	SCB	449979	57	2	2	5	1	9.6	-	20	Yes	90	62	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	2	-	11	11	11	10	8	9	7	4	-	10	6.8
120	VKM	957708	68	1	2	1	1	9.6	-	14	Yes	90	64	1	Absent	Absent	Present	Present	Absent	Present	Absent	Absent	Absent	2	-	13	14	13	11	11	9	-	-	-	9	9
121	BS	459530	56	2	2	11	1	11	-	12	Yes	90	62	2	Absent	Absent	Absent	Present	Present	Absent	Absent	Absent	Absent	1	-	14	14	13	12	11	9	-	-	-	8	8.6
122	PL	942200	65	1	3	6	1	11	-	16	Yes	88	64	1	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	2	-	13	18	15	15	13	10	8	-	-	6.8	6.7
123	A	804852	45	2	2	11	1	10	1.9	15	Yes	90	65	2	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	4	-	14	15	13	11	-	9	6	4	-	9.6	12.2
124	JS	371155	55	2	3	3	1	11	3	7	Yes	90	62	1	Absent	Present	Absent	Absent	Present	Absent	Present	Absent	Absent	2	-	15	14	10	9	6	7	6	5	-	8	8.2
125	HK	933221	66	2	1	4	2	12.4	-	11	Yes	88	58	1	Present	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	18	20	18	17	-	-	-	-	-	10.9	9
126	RD	724791	76	2	1	2	1	9	-	15	Yes	84	58	1	Absent	Absent	Absent	Present	Present	Absent	Absent	Present	Present	4	-	14	15	14	15	15	12	12	-	-	7.6	8
127	PK	791773	86	2	2	1	1	9.9	-	17	Yes	88	60	1	Absent	Absent	Absent	Present	Present	Absent	Absent	Absent	Absent	4	-	15	15	-	-	-	-	-	-	-	8	8
128	MRS	725970	65	1	3	11	1	9.5	-	10	Yes	100	64	2	Present	Present	Absent	Present	Absent	Absent	Absent	Absent	Absent	2	-	16	18	16	12	9	10	5	3	-	7.7	8.1
129	PS	805249	45	1	2	8	1	9.6	4	13	Yes	88	58	1	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Present	2	-	15	14	14	11	13	-	-	-	-	8	8.6
130	RS	297707	67	2	2	11	1	11	2	11	Yes	90	60	2	Present	Present	Absent	Present	Present	Absent	Absent	Present	Absent	1	-	14	14	13	14	12	11	-	-	-	9.4	10
131	KS	950886	58	1	2	6	1	8.6	1.9	13	Yes	92	60	1	Absent	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	4	-	15	15	14	13	12	13	-	-	-	7.9	7.9
132	MS	944258	76	2	3	11	1	8.9	2.4	11	Yes	90	64	2	Absent	Present	Absent	Present	Absent	Absent	Absent	Absent	Absent	4	-	19	18	18	-	-	-	-	-	-	8.9	9.8

Serial no.	Name	MRD	s.Creat_day 3	s.Creat_day 5	s.Creat_day 7	s.Creat_day 10	s.Creat_day 14	s.Creat_day 30	s. Urea	s.Urea_day 0	s.Urea_day 1	s.Urea_day 3	s.Urea_day 5	URR	s.Urea_day 7	s.Urea_day 10	s.Urea_day 14	s.Urea_day 30	UOP (24hrs)	UOP (24hrs) day 0	UOP (24hrs) day 1	UOP (24hrs) day 3	UOP(24hrs)_day 5	UOP(24hrs)_day 7	UOP(24hrs)_day 10	UOP(24hrs)_day 14	UOP(24hrs)_day 30	Ph	Ph_day 0	Ph_day 1	Ph_day 3	Ph_day 5
67	RKA	920843	9.8	7.2	6.8	5.5	5.2	4.4	-	256	256	95	105	62.9	77	45	88	66	-	350	350	500	1450	1350	1300	800	800	-	7.16	7.17	7.24	7.3
68	JS	806411	9.8	7.5	3.7	5.1	4.5	-	-	210	220	101	56	54.1	50	83	50	-	-	500	400	350	300	1300	700	800	-	-	7.12	7.12	7.14	7.25
69	PK	957243	6.4	5.4	4.1	4.1	-	-	-	168	168	64	83	61.9	46	97	-	-	-	700	600	250	270	300	600	-	-	-	7.1	7.1	7.25	7.16
70	SS	31929	10	10.5	8.6	-	-	-	-	203	203	101	61	50.2	56	-	-	-	-	400	500	300	1350	1250	-	-	-	-	7.14	7.19	7.13	7.26
71	KS	941424	5.4	4.6	7.2	8.9	-	-	-	165	170	68	93	60.0	94	86	-	-	-	300	400	550	1200	1250	1400	-	-	-	7.14	7.14	7.28	7.23
72	BL	184581	7.6	6.5	4.5	3.5	2.8	1.3	-	170	180	103	90	42.8	47	98	65	46	-	300	800	1000	1000	1100	2000	1900	2700	-	7.12	7.16	7.26	7.29
73	BS	915489	7.2	5.9	4.9	5.1	4.4	-	-	150	170	78	117	54.1	116	97	68	-	-	300	300	400	1550	1500	800	800	-	-	7.14	7.16	7.19	7.15
74	KL	93934	7.5	6.6	4.8	3.2	1.5	0.8	-	117	130	56	60	56.9	85	54	48	45	-	1200	1200	150	1850	2550	2800	3850	4000	-	7.2	7.23	7.26	7.29
75	KS	791824	8.4	9.8	7.2	-	-	-	-	169	169	66	91	60.9	76	-	-	-	-	500	400	320	1290	1250	-	-	-	-	7.11	7.14	7.18	7.33
76	HS	918158	6.4	5.8	4.5	1.8	2	-	-	198	179	102	128	43.0	66	144	102	-	-	400	400	450	1375	1400	1600	500	-	-	7.1	7.11	7.19	7.26
77	GS	796052	6.2	2.5	3.1	-	-	-	-	156	156	66	78	57.7	56	-	-	-	-	400	500	1400	1450	1350	-	-	-	-	7.21	7.24	7.28	7.33
78	AS	969220	7.6	5.5	5.8	4.5	2.9	1.2	-	250	140	62	122	55.7	105	74	58	60	-	800	800	950	1200	1700	2200	2450	2500	-	7.11	7.12	7.25	7.29
79	HK	935004	5.2	4.5	5.6	4	1.4	1	-	265	270	120	95	55.6	87	92	66	46	-	800	500	600	600	900	1750	1100	1400	-	7.13	7.14	7.34	7.45
80	SS	958627	7.4	6.4	5.4	3.5	2.3	1.4	-	184	200	78	110	61.0	90	75	55	36	-	650	650	900	1300	1500	1550	1700	1800	-	7.1	7.1	7.28	7.32
81	DC	952484	7	9.7	4.6	7.2	-	-	-	167	170	95	110	44.1	95	102	-	-	-	550	600	1500	1300	1350	1500	-	-	-	7.11	7.12	7.39	7.35
82	GS	449429	7.6	4.2	5.2	6.5	2.8	1	-	162	172	82	72	52.3	85	85	67	44	-	800	1000	900	1250	1500	1850	2000	2400	-	7.12	7.19	7.31	7.31
83	KR	268515	5.2	4.9	3	5	-	-	-	110	110	43	82	60.9	49	98	-	-	-	400	400	500	450	900	800	-	-	-	7.09	7.09	7.31	7.3
84	JK	952102	7.1	4.2	6.3	3.1	-	-	-	180	180	82	80	54.4	76	45	-	-	-	500	600	340	1400	1425	350	-	-	-	7.1	7.1	7.19	7.24
85	GS	714651	4.2	5	4.1	4.9	4.5	3.9	-	201	220	104	110	52.7	98	112	152	101	-	250	650	1000	1400	1600	1700	1900	1700	-	7.15	7.16	7.01	7.44
86	NK	467971	7.6	6.3	4.4	4.4	2.1	1.3	-	320	220	87	120	60.5	100	95	60	40	-	700	650	1400	1250	1250	1900	2200	2100	-	7.11	7.09	7.29	7.44
87	MJ	949220	7.5	8.4	3.8	5.5	4.2	-	-	184	190	102	80	46.3	88	114	98	-	-	450	550	1350	1380	1400	1420	700	-	-	7.09	7.1	7.17	7.36
88	P	916639	5	4.7	3.5	6	2.8	3.9	-	230	201	77	91	61.7	76	44	76	50	-	700	600	800	1350	1650	1800	2200	2800	-	7.2	7.19	7.2	7.26
89	SKM	776651	7.2	6.5	5.5	4.3	-	-	-	175	180	83	90	53.9	65	66	-	-	-	500	500	700	450	800	1000	-	-	-	7.14	7.15	7.2	7.26
90	JS	810544	7.6	5.7	2.9	1.2	1.4	-	-	187	190	102	93	46.3	102	76	65	-	-	800	800	1200	1500	2000	2300	3000	-	-	7.02	7.21	7.34	7.32
91	R	921003	10	9.7	-	-	-	-	-	210	210	115	78	45.2	-	-	-	-	-	200	200	300	1350	-	-	-	-	-	7.17	7.19	7.23	8
92	KD	802241	6.9	7.2	4.5	-	-	-	-	167	178	65	80	63.5	67	-	-	-	-	450	550	600	430	450	1000	-	-	-	7.09	7.09	7.15	7.29
93	HK	288463	6.5	5.5	5.2	-	-	-	-	195	200	96	115	52.0	67	-	-	-	-	500	500	550	400	790	-	-	-	-	7.1	7.14	7.29	7.28
94	BK	980590	5	4.6	3.5	3.2	2.8	1.3	-	192	200	105	124	47.5	125	56	65	44	-	600	700	800	1250	1650	1800	2500	2800	-	7.11	7.19	7.25	7.28
95	BS	801356	6.9	4.2	-	-	-	-	-	167	167	86	50	48.5	-	-	-	-	-	400	300	350	250	-	-	-	-	-	7.14	7.16	7.32	7.24
96	RA	192383	5.5	5.7	3.2	2.5	1.4	1	-	259	239	110	150	54.0	120	80	80	45	-	700	650	1750	800	600	1500	2200	2300	-	7.15	7.19	7.2	7.3
97	JS	34271	6.4	4.4	6.1	4.2	3.8	2.5	-	200	187	96	147	48.7	78	65	45	65	-	500	400	550	1200	900	1500	1200	1100	-	7.11	7.22	7.19	7.22
98	GK	976872	4.8	5.2	6	4.2	5	4.5	-	288	200	119	124	40.5	70	38	47	44	-	200	300	500	1000	1000	1500	2500	4000	-	7.1	7.11	7.28	7.34
99	HK	806097	6.2	4.1	5.8	3.4	4	-	-	178	190	101	80	46.8	65	45	66	-	-	500	400	400	500	1300	1000	700	-	-	7.13	7.13	7.18	7.3
100	BB	937657	-	-	-	-	-	-	-	195	200	113	122	43.5	-	-	-	-	-	800	800	-	-	-	-	-	-	-	7.1	7.25	-	-
101	D	885321	8.6	6.4	5.4	4.8	4.2	-	-	185	190	100	102	47.4	67	95	100	-	-	600	700	320	390	350	300	600	-	-	7.12	7.22	7.25	7.35
102	BK	811581	4.4	6.5	7.2	3.5	3.2	-	-	166	166	72	92	56.6	109	45	65	-	-	500	600	450	1300	1400	1350	1200	-	-	6.9	7.21	7.3	7.23
103	JS	155951	8.2	4.4	5.5	3.4	-	-	-	176	176	69	85	60.8	56	78	-	-	-	500	600	1450	1290	1320	600	-	-	-	7.05	7.15	7.22	7.26
104	NKT	953350	10.6	9.8	7.6	5.4	3.5	1.2	-	198	198	101	90	49.0	95	73	69	56	-	800	900	850	1050	1500	1700	2200	2000	-	7.13	7.15	7.3	7.34
105	NK	941462	5.2	4.6	4.2	3.5	-	-	-	165	190	110	110	42.1	90	68	-	-	-	300	400	710	450	525	350	-	-	-	7.09	7.26	7.15	7.18
106	DS	267354	11	6.2	6.8	5.4	2.4	1	-	240	210	92	126	56.2	87	65	45	42	-	900	800	800	1500	1900	2200	2300	2725	-	7.25	7.15	7.22	7.28
107	SK	792283	7.9	4.9	4.6	4.2	5	4.5	-	160	150	85	50	43.3	67	90	44	65	-	200	300	500	1500	1000	2000	1500	1500	-	7.1	7.11	7.22	7.28
108	M	922790	6.4	5.1	4.7	3	4	-	-	164	170	76	112	55.3	55	66	809	-	-	400	400	500	555	1390	500	1000	-	-	7.11	7.14	7.2	7.23
109	MK	928552	5.2	5.7	4.5	3.1	1.5	0.8	-	200	180	73	90	59.4	88	66	35	38	-	700	800	960	1060	1560	1950	2100	2250	-	7.11	7.1	7.17	7.26
110	VK	941632	7.9	5.3	4.9	-	-	-	-	197	190	94	116	50.5	98	-	-	-	-	400	650	325	900	800	-	-	-	-	7.2	7.2	7.25	7.32
111	GS	481221	6.5	5.5	4.9	5.9	2.6	1.5	-	220	250	115	112	54.0	125	74	50	40	-	800	700	950	1250	1500	1800	2000	2380	-	7.21	7.21	7.17	7.3
112	TD	962213	6.1	4.9	5.5	4.5	-	-	-	156	160	80	80	50.0	78	100	-	-	-	450	550	300	720	1800	1600	-	-	-	7.11	7.1	7.16	7.25
113	JS	773014	6.2	5.2	4.2	4	-	-	-	190	190	79	123	58.4	100	132	-	-	-	400	400	350	650	500	600	-	-	-	7.11	7.11	7.26	7.27
114	LS	792712	5.2	5.6	4.3	4	-	-	-	156	160	75	80	53.1	74	88	-	-	-	600	400	300	600	800	-	-	-	-	7.1	7.1	7.25	7.28
115	SK	803736	5.5	6.4	4.5	3.4	-	-	-	134	140	65	124	53.6	176	76	-	-	-	450	500	1320	400	1400	600	-	-	-	7.21	7.2	7.25	7.19
116	SN	565055	6.8	4.5	5	6	6	4.2	-	275	275	109	84	60.4	98	124	42	38	-	800	900	800	1000	1100	2100	1900	2600	-	7.02	7.12	7.28	7.34
117	M	936343	8.5	5.5	4.5	3.2	2.9	1.2	-	239	150	79	60	47.3	112	80	75	45	-	700	700	1100	1400	1900	2100	2900	4000	-	7.1	7.12	7.28	7.32
118	VK	922058	-	-	-	-	-	-	-	215	215	80	95	62.8	-	-	-	-	-	300	300	-	-	-	-	-	-	-	7.17	7.17	-	-
119	SCB	449979	4.4	5.6	8.4	3.5	2.3	1.4	-	186	166	73	110	56.0	65	88	67	44	-	700	650	2200	1300	1700	1550	1650	1825	-	7.11	7.1	7.28	7.32
120	VKM	957708	7.9	8.3	4	3	-	-	-	198	200	79	92	60.5	88	98	-	-	-	500	490	450	1370	900	1200	-	-	-	7.2	7.2	7.25	7.42
121	BS	459530	7.6	8.8	5.4	4.4	-	-	-	178	180	83	90	53.9	86	98	-	-	-	500	600	550	320	475	600	-	-	-	7.16	7.16	7.29	7.35
122	PL	942200	5.9	4.9	5.5	3.6	3.3	-	-	166	166	73	93	56.0	75	66	54	-	-	450	700	450	1600	1750	1350	425	-	-	7.13	7.12	7.16	7.25
123	A	804852	7.5	9.5	5.2	1	1.2	1.2	-	201	230	101	71	56.1	55	85	51	34	-	500	600	550	600	290	1400	1200	1600	-	7.04	7.14	7.29	7.28
124	JS	371155	4.8	5.2	6	4.2	5	4.5	-	298	298	123	100	58.7	90	201	138	140	-	550	450	600	700	800	1200	1200	1400	-	7.11	7.11	7.28	7.34
125	HK	933221	9.8	7.5	6.2	5.7	4.9	-	-	213	230	102	40	55.7	94	35	60	-	-	300	300	350	1390	1500	775	400	-	-	7.11	7.12	7.14	7.15
126	RD	724791	6.8	5.7	4.6	4	4	-	-	178	180	81	100	55.0	55	54	44	-	-	400	400	500	1450	1450	800	1000	-	-	7.16	7.16	7.23	7.28
127	PK	791773	-	-	-	-	-	-	-	168	168	65	102	61.3	-	-	-	-	-	450	600	-	-	-	-	-	-	-	7.14	7.15	-	-
128	MRS	725970	7.5	6.6	4.8	3.2	2.8	1.3	-	117	140	67	92	52.1	120	54	48	45	-	600	6850	950	600	900	1200	900	1400	-	7.2	7.23	7.26	7.29
129	PS	805249	5.6	5.2	6.1	-	-	-	-	170	180	73	49	59.4	83	50	-	-	-	300	500	450	500	450	-	-	-	-	7.2	7.29	7.42	7.33
130	RS	297707	9.7	6.8	7.7	7.4	-	-	-	198	198	72	100	63.6	98	76	-	-	-	400	275	350	1375	1000	1475	-	-	-	7.09	7.11	7.16	7.29
131	KS	950886	5.6	7.2	4.7	4.6	-	-	-	178	178	102	90	42.7	76	64	-	-	-	350	700	700	1450	1390	800	-	-	-	7.13	7.13	7.24	7.39
132	MS	944258	-	-	-	-	-	-	-	200	200	106	122	47.0	-	-	-	-	-	400	300	-	-	-	-	-	-	-	7.2	7.2	-	-

Serial no.	Name	MRD	Ph_day 7	Ph_day 10	Ph_day 14	Ph_day 30	Lactate	Lactate_ day 0	Lactate_d ay 1	Lactate_d ay 3	Lactate_d ay 5	Lactate_d ay 7	Lactate_d ay 10	Lactate_d ay 14	Lactate_d ay 30	S HCO3	S HCO3_day 0	S HCO3_da y 1	S HCO3_da y 3	S HCO3_da y 5	S HCO3_da y 7	S HCO3_da y 10	S HCO3_da y 14	S HCO3_da y 30	HR	HR_day 0	HR_day 1	HR_day 3	HR_day 5	HR_day 7	HR_day 10	HR_day 14
67	RKA	920843	7.31	7.33	7.4	7.44	-	8.4	8	3.2	2.3	1.9	2.4	3.2	2	-	9	10.8	18.3	12.9	17.2	18.6	16	12	-	130	122	116	126	126	110	98
68	JS	806411	7.34	7.27	7.44	-	-	11	12.2	5.6	5.3	2	2.5	1.2	-	-	10.2	10.2	16.5	15.2	14.3	18.6	13.6	-	-	138	128	132	134	98	88	90
69	PK	957243	7.32	7.28	-	-	-	6.4	6	2.3	2.4	1.5	1.4	-	-	-	13.6	14	18.6	118.1	18.3	19.2	-	-	-	100	120	120	100	98	110	-
70	SS	31929	7.39	-	-	-	-	7.9	7	3	3.2	2	-	-	-	-	9.4	9.4	11.4	12.3	8.8	-	-	-	-	135	125	122	98	111	-	-
71	KS	941424	7.26	7.28	-	-	-	13.3	9.6	7	2.3	3.1	4.1	-	-	-	13	11	11.5	10.4	9.1	10.4	-	-	-	140	130	120	126	122	120	-
72	BL	184581	7.37	7.35	7.39	-	-	10.8	7.8	2.4	3.2	2.2	1.6	2.1	1.6	-	9	10	18.2	20	20.8	18	24.9	21	-	112	96	96	106	98	96	94
73	BS	915489	7.16	7.22	7.3	-	-	7	7.9	9.4	3.2	3.3	4.4	2.3	-	-	9.9	10	12.9	18	17.3	17	14	-	-	134	124	122	124	110	98	98
74	KL	93934	7.3	7.31	7.32	7.34	-	4	4.2	1.8	1.7	2.4	2.5	0.8	0.9	-	9	9	16.2	20.5	19.4	20.5	20.6	18	-	104	94	94	104	98	96	68
75	KS	791824	7.3	-	-	-	-	5.3	5	1.6	3.1	1.8	-	-	-	-	9	9.7	13.5	18.3	17.2	-	-	-	-	134	122	116	110	98	-	-
76	HS	918158	7.28	7.38	7.2	-	-	7	7.9	3	2.2	1.7	2	1	-	-	9.5	10	10.1	1.9	1	3	12	-	-	140	130	122	126	110	90	78
77	GS	796052	7.32	-	-	-	-	6.6	6	2.3	2.1	2	-	-	-	-	11	10.5	18.6	13.6	15.9	-	-	-	-	120	110	102	122	98	-	-
78	AS	969220	7.32	7.36	7.37	7.39	-	5	5.3	5.9	4.3	2.8	1.6	1.2	1	-	9	11	17	16.7	17	21	25.9	22.2	-	119	108	108	112	104	98	90
79	HK	935004	7.35	7.34	7.29	-	-	6	5.3	6.9	1.6	1.9	1.4	1.4	0.6	-	8	9	15	15	21	17	21	21	-	98	92	96	98	86	84	92
80	SS	958627	7.35	7.33	7.35	7.27	-	4	4.6	3.4	2	2.4	1.8	1.2	0.7	-	12	12.9	14.9	19.4	20	19.4	20.2	19	-	99	88	88	96	94	92	90
81	DC	952484	7.34	7.28	-	-	-	12	12	2	3.2	3.3	1.9	2	-	-	9	9.8	10.5	8.8	15.9	18.3	-	-	-	120	118	122	124	126	118	-
82	GS	449429	7.45	7.44	7.34	7.39	-	4	3.6	3	1.9	2	1.5	1	0.8	-	10	11.5	15	17	18.5	21	20.5	18	-	98	94	94	107	104	100	98
83	KR	268515	7.31	7.32	-	-	-	9.6	9	7.9	1.9	1.5	1.5	-	-	-	9	10.4	13.9	12	8.18	16	-	-	-	128	118	118	110	110	100	-
84	JK	952102	7.42	7.43	-	-	-	8	6	2.5	4.1	1.7	1.6	-	-	-	9.4	10	12.3	14.3	16.9	18.2	-	-	-	130	126	126	126	100	98	-
85	GS	714651	7.32	7.27	7.34	-	-	14.4	8.2	3.9	1.9	2	2.5	1.5	0.8	-	14	15	20	23	16.8	16	18	24	-	102	90	91	89	101	98	97
86	NK	467971	7.33	7.45	7.35	7.36	-	5	4	3	3	2.1	1.9	1	1.2	-	9.5	10.5	13	17	20	23.6	21.4	20.2	-	110	99	94	105	100	96	88
87	MJ	949220	7.29	7.39	7.32	-	-	5.6	5.6	3.4	2	1.2	2.3	4	-	-	10	10.2	18.2	15.9	9.4	18.3	16	-	-	130	124	118	124	100	101	102
88	P	916639	7.39	7.22	7.37	7.32	-	8	9.6	4	2.2	2	1.7	0.9	0.5	-	9	8	18	22	21	16.9	17	16	-	110	101	104	110	108	102	98
89	SKM	776651	7.29	-	-	-	-	9.6	9	2	1.3	2.3	1	-	-	-	9	10.4	16.5	15.5	20.3	18	-	-	-	128	120	112	99	98	88	-
90	JS	810544	7.34	7.36	7.34	-	-	5.7	6	1.6	2	1.2	1.1	1.6	-	-	13.6	13.6	21.1	19.4	19.5	18.7	15.9	-	-	130	120	116	110	108	86	80
91	R	921003	-	-	-	-	-	8.7	8	3.5	3.2	-	-	-	-	-	9	10	11.4	14.1	-	-	-	-	-	138	128	122	111	-	-	-
92	KD	802241	7.31	7.43	-	-	-	5	5.6	2.5	2	2.5	1	2.3	-	-	5	5.3	12.5	15.9	16.9	10.2	12	-	-	133	121	125	112	128	110	100
93	HK	288463	7.35	-	-	-	-	7	7.9	9.4	4.2	2.6	-	-	-	-	9	9.8	14.5	13.6	13	-	-	-	-	123	122	120	98	109	-	-
94	BK	980590	7.29	7.32	7.35	7.42	-	7.7	7	2.4	1.3	1.8	1.3	1.2	0.4	-	10	11	15.8	18	21.3	14	16.4	20.3	-	105	105	104	110	112	102	98
95	BS	801356	-	-	-	-	-	5.9	6	3	3.4	-	-	-	-	-	5.1	6	8.8	13.5	-	-	-	-	-	130	118	114	136	-	-	-
96	RA	192383	7.31	7.34	7.37	7.44	-	6	8.6	4	3	1	2	1.6	1	-	10	9.1	19.4	21.7	18	22	18	22.9	-	110	102	96	108	98	94	92
97	JS	34271	7.22	7.26	7.31	7.31	-	5	4	4.1	3.9	1.6	2	1	1	-	9.7	10	14	18	22	19	21	23	-	98	88	86	90	94	98	88
98	GK	976872	7.45	7.34	7.3	7.29	-	7	7.9	4	3.4	2	1.9	1.6	1.3	-	15	16	21.2	24.3	23.2	18.4	21.3	26.8	-	116	106	88	104	100	92	84
99	HK	806097	7.32	7.43	7.44	-	-	6	5.5	2.3	2.1	2.5	2	2.5	1.2	-	9.4	10	12.3	14.3	16.9	17	18	-	-	133	123	120	113	110	98	110
100	BB	937657	-	-	-	-	-	14.6	4.8	-	-	-	-	-	-	-	9	10	-	-	-	-	-	-	-	132	122	-	-	-	-	-
101	D	885321	7.32	7.35	7.37	-	-	5.6	5.6	3.5	2.1	1.3	2	2.1	-	-	8	9	18	22	19	17.9	20	21	-	130	130	124	79	98	100	98
102	BK	811581	7.33	7.44	7.34	-	-	5.7	6	3.5	2.5	5	7.9	4.7	-	-	9.9	10	14.9	18.7	12.2	11.1	9.4	-	-	34	118	122	116	110	98	110
103	JS	155951	7.39	7.34	-	-	-	5.3	5	1.9	1.3	2	3.1	2	-	-	12.2	12	16.5	18.5	22.3	19	-	-	-	120	120	112	118	114	98	-
104	NKT	953350	7.35	7.39	7.4	7.35	-	6.2	6	2.8	2.3	1.6	1.1	0.7	0.4	-	11	11	16.5	18.5	20	18	21.1	19	-	106	94	90	96	92	96	94
105	NK	941462	7.29	7.34	-	-	-	7	8.2	3	5	3.4	3	-	-	-	14.3	10	13.8	12.2	11.1	9.1	-	-	-	130	120	127	128	102	107	-
106	DS	267354	7.39	7.33	7.35	7.22	-	8	7.4	2	1.6	1	0.9	1.2	1	-	9	9.4	15.2	17.8	19	18.6	19	20.4	-	102	103	96	100	98	96	92
107	SK	792283	7.41	7.29	7.42	7.34	-	5.5	6	5.6	2.9	2	1	1	1	-	14.5	13	18	21	16	13	16	20	-	100	110	88	104	102	92	84
108	M	922790	7.24	7.34	7.34	-	-	7	7.9	2.9	2.2	2	1.6	1.9	-	-	9.3	10	17.8	17.8	14.3	18	14	-	-	109	128	122	132	110	100	102
109	MK	928552	7.37	7.3	7.34	7.35	-	6	7	3	1	1	1	0.8	1	-	9	11	21.1	18	18.5	18.7	15.9	21	-	109	100	98	112	106	104	106
110	VK	941632	7.33	-	-	-	-	11.2	8.7	6	3	4.5	4	-	-	-	14	10	13.8	12.2	11.1	-	-	-	-	130	120	124	114	104	-	-
111	GS	481221	7.33	7.37	7.37	7.38	-	4	5.3	5	4.3	2	1.6	1.2	1	-	9	11	16	15	17	21	24	22.2	-	118	108	104	106	98	94	92
112	TD	962213	7.29	7.33	-	-	-	5	4.8	2.2	3.3	2.3	4.3	-	-	-	9	10.5	15.8	18.6	16	18	-	-	-	107	112	116	128	110	112	-
113	JS	773014	7.29	7.31	-	-	-	8.4	8	3.2	2.3	3	1.8	-	-	-	9	12	15.9	10.2	16.5	10.4	-	-	-	126	118	118	98	78	98	-
114	LS	792712	7.34	-	-	-	-	5	4.9	2.6	2	3	-	-	-	-	8.8	9	18.3	16.9	10	9	-	-	-	130	129	123	110	100	-	-
115	SK	803736	7.41	7.34	-	-	-	5	5.5	4.6	3.3	2.3	3.2	-	-	-	5.6	6	11.1	16	14.4	18	-	-	-	140	128	104	112	98	110	-
116	SN	565055	7.43	7.44	7.34	7.36	-	5.3	5	7.5	1.5	1.4	1.1	1.2	1	-	10	11	18	21.9	18.8	22.2	20.2	24.2	-	114	94	90	100	98	101	98
117	M	936343	7.35	7.36	7.37	-	-	6.3	3.4	3.1	3.1	2.4	1.9	1.6	1.2	-	9	10	17.6	21	20	21	22	19	-	123	96	96	102	104	102	100
118	VK	922058	-	-	-	-	-	8.4	8	-	-	-	-	-	-	-	10	11	-	-	-	-	-	-	-	128	118	-	-	-	-	-
119	SCB	449979	7.45	7.33	7.37	7.27	-	7	7.5	3	1.5	1	2	1.2	0.4	-	13	14	18.5	21	22.1	20	24	24	-	98	84	84	96	90	88	86
120	VKM	957708	7.34	7.28	-	-	-	4	3.9	2.3	3.2	1	1.6	-	-	-	9	8.8	10.1	20.5	17	18	-	-	-	133	123	124	101	88	90	-
121	BS	459530	7.28	7.33	-	-	-	4	4.8	2.4	3.1	2.3	4.3	-	-	-	11.9	12	12.5	18.3	14.9	15	-	-	-	140	132	126	110	98	98	-
122	PL	942200	7.28	7.32	7.34	-	-	10.8	5.8	2.5	4	4	3	4.2	-	-	9.1	9.8	14.3	12.2	9.7	12.2	8.2	-	-	120	118	116	130	100	98	113
123	A	804852	7.35	7.26	7.36	7.25	-	6	8	4.5	3.4	2.6	1.4	2.1	1	-	12	14	18.4	20.1	21	18.2	17	22	-	126	120	120	126	100	96	88
124	JS	371155	7.45	7.34	7.3	-	-	11.2	5	5.2	1.5	2.4	2.2	1.2	1.6	-	11	12	17	21	22.2	20.5	21.1	22	-	116	106	88	104	100	92	84
125	HK	933221	7.45	7.34	7.33	-	-	7	7.7	4.4	5.3	3.4	2.5	2.3	-	-	9.4	10	15.6	15.2	10.5	14	9	-	-	128	132	132	138	126	100	110
126	RD	724791	7.34	7.36	7.34	-	-	7	7.9	4.2	4.2	2	3	3	-	-	10	11	17.2	16.2	16.8	17	-	-	-	136	126	122	130	124	100	98
127	PK	791773	-	-	-	-	-	7.2	7	-	-	-	-	-	-	-	10.2	10.2	-	-	-	-	-	-	-	120	114	-	-	-	-	-
128	MRS	725970	7.3	7.31	7.32	-	-	12	6.6	2.6	2.9	1.8	1.9	1	1.2	-	11	14	19	21	18.8	20.5	19	19	-	98	94	94	104	98	96	68
129	PS	805249	7.13	7.31	-	-	-	5	5.8	2.6	3.3	2.3	-	-	-	-	10.5	10.5	15.8	10.5	12.3	-	-	-	-	134	110	116	132	118	-	-
130	RS	297707	7.33	7.35	-	-	-	15	11	4	2.2	1.4	3.2	1.8	-	-	10.6	11	13.6	16.9	11.5	14.9	-	-	-	120	112	120	102	100	99	-
131	KS	950886	7.23	7.42	-	-	-	5.6	5.6	3	1.9	1.5	1.6	-	-	-	10.9	11	18.3	13.6	26.5	21.1	-	-	-	102	118	112	114	101	102	-
132	MS	944258	-	-	-	-	-	8.2	8	-	-	-	-	-	-	-	9.1	9.3	-	-	-	-	-	-	-	104	132	-	-	-	-	-

Serial no.	Name	MRD	HR_day 30	MAP	MAP_day 0	MAP_day 1	MAP_day 3	MAP_day 5	MAP_day 7	MAP_day 10	MAP_day 14	MAP_day 30	CVP	CVP_day 0	CVP_day 1	CVP_day 3	CVP_day 5	CVP_day 7	CVP_day 10	CVP_day 14	CVP_day 30	s. K	S.K_day 0	S.K_day 1	S.K_day 3	S.K_day 5	S.K_day 7	S.K_day 10	S.K_day 14	S.K_day 30	Need for mechanical ventilation.	Total days on mechanical ventilation
67	RKA	920843	80	-	59	61	64	64	63	61	80	80	-	14	14	12	10	8	7	9	-	-	6.5	6	4.2	4.9	4.2	4	4.2	-	Yes	5
68	JS	806411	-	-	60	68	70	60	84	88	88	-	-	14	14	12	11	11	9	8	-	-	6	6.5	4.2	4.4	5.4	4	3	-	Yes	5
69	PK	957243	-	-	64	62	65	83	66	62	-	-	-	14	13	11	10	8	7	-	-	-	5.5	6	4.5	5.6	3.7	4	-	-	Yes	6
70	SS	31929	-	-	63	64	66	65	63	-	-	-	-	16	17	15	14	11	-	-	-	-	6.2	6.3	4.5	5.3	3.9	-	-	-	No	-
71	KS	941424	-	-	62	62	63	65	64	76	-	-	-	15	14	11	9	7	8	-	-	-	7.1	5.9	5.4	5	4.7	4	-	-	Yes	8
72	BL	184581	86	-	65	70	64	68	68	68	70	70	-	14	10	9	8	7	6	4	-	-	6.4	6.4	3.7	5.3	4.9	4.2	4.1	3.9	Yes	7
73	BS	915489	-	-	62	62	65	74	76	86	80	-	-	16	15	12	11	7	9	6	-	-	6	6.3	3.6	4.2	4	3.8	4	-	Yes	10
74	KL	93934	92	-	64	72	6	66	68	69	71	78	-	10	10	9	7	8	6	-	-	-	5	4.5	4.2	3.9	3.7	3.9	3.8	3.5	Yes	6
75	KS	791824	-	-	68	70	72	68	64	-	-	-	-	18	18	16	14	12	-	-	-	-	5.4	5	3.4	4.1	3.8	-	-	-	Yes	6
76	HS	918158	-	-	60	60	64	64	63	90	78	-	-	14	13	10	9	8	8	7	-	-	6	6.3	3.6	4.5	4.2	3.9	3.6	-	Yes	9
77	GS	796052	-	-	61	66	63	69	65	-	-	-	-	13	13	11	9	8	-	-	-	-	7	7.2	4.6	4.9	5.4	-	-	-	No	-
78	AS	969220	82	-	68	64	69	70	75	68	70	74	-	14	14	12	10	9	7	5	-	-	6.2	6	4.3	3.6	3.4	3.5	3.5	3.6	No	-
79	HK	935004	86	-	60	65	66	78	76	75	76	79	-	15	14	8	9	10	8	7	-	-	4.5	4.5	4.4	3.6	4	5.6	4.5	5	Yes	5
80	SS	958627	88	-	70	64	66	67	70	69	66	78	-	11	10	9	8	7	8	7	-	-	5.1	5	4.5	4.4	3.8	3.9	3.7	3.6	No	-
81	DC	952484	-	-	74	75	70	65	67	65	-	-	-	12	12	10	8	7	5	-	-	-	6.1	6.8	4.6	4.3	4.2	3.1	-	-	Yes	6
82	GS	449429	94	-	70	69	65	76	73	76	75	77	-	15	14	9	10	9	10	8	-	-	5.7	6.5	4.3	4.4	4.5	3.9	5	4.3	Yes	7
83	KR	268515	-	-	63	62	64	61	78	80	-	-	-	14	13	11	11	7	9	-	-	-	6.9	7	4.4	4.4	4.1	3.3	-	-	No	-
84	JK	952102	-	-	73	74	72	88	67	76	-	-	-	17	17	14	12	11	9	-	-	-	7.6	7	4.3	6.5	4.5	4.8	-	-	Yes	6
85	GS	714651	100	-	65	70	68	62	80	78	74	80	-	12	12	12	10	11	9	10	-	-	5.4	5.2	3.6	3.2	5.2	4.3	3.4	4	No	7
86	NK	467971	100	-	61	68	76	82	66	64	71	64	-	14	13	12	11	10	9	7	-	-	6.2	6	4.5	5.4	6.3	3.4	5.4	3.5	No	-
87	MJ	949220	-	-	65	66	64	63	63	74	84	-	-	10	10	8	7	5	6	7	-	-	5.6	5.8	3.4	4.4	2.6	3.6	4.3	-	Yes	5
88	P	916639	96	-	65	74	69	67	64	66	72	75	-	15	15	13	14	12	9	10	-	-	5.8	6	3.9	3.9	4.1	4	3.8	4.1	Yes	8
89	SKM	776651	-	-	61	62	64	64	63	68	-	-	-	15	15	13	9	8	5	-	-	-	5.5	5	4.6	4.1	3.5	3.2	-	-	Yes	9
90	JS	810544	-	-	68	70	70	72	70	84	82	-	-	12	12	14	12	10	11	10	-	-	6.6	5	3.4	3.4	3	4.9	4.3	-	No	-
91	R	921003	-	-	60	60	62	61	-	-	-	-	-	15	15	13	12	-	-	-	-	-	7.3	7	5.5	5.3	-	-	-	-	Yes	7
92	KD	802241	-	-	62	60	65	70	74	79	90	-	-	14	14	12	10	8	6	8	-	-	6.7	6	5.5	3.5	3.9	4.2	4	-	No	-
93	HK	288463	-	-	58	60	61	62	61	-	-	-	-	13	12	10	8	8	-	-	-	-	5	6	3.5	4.9	4.6	-	-	-	Yes	7
94	BK	980590	94	-	74	76	68	66	65	74	70	74	-	14	15	13	14	12	9	10	-	-	6.2	6	4.6	3.5	3.6	3.2	4.1	4.2	Yes	9
95	BS	801356	-	-	66	66	68	62	-	-	-	-	-	17	17	14	11	-	-	-	-	-	6.97	6	4.5	3.2	-	-	-	-	Yes	5
96	RA	192383	86	-	69	75	62	64	78	78	75	82	-	10	10	9	8	9	7	7	-	-	6.8	6	4.5	4.6	3.5	4.8	4.6	3.7	Yes	5
97	JS	34271	90	-	66	67	80	80	78	68	70	88	-	11	11	12	13	12	14	-	-	-	6.5	7	4.3	3.2	4.3	4.9	4.8	4	No	0
98	GK	976872	98	-	68	69	67	71	73	74	75	800	-	10	11	10	12	10	8	9	-	-	6	5.9	4.6	4.2	3.8	5.1	4.1	3.5	Yes	5
99	HK	806097	-	-	58	71	60	64	60	88	66	-	-	17	17	15	13	11	9	8	-	-	5.7	6	4.6	4	3.6	3.6	4	-	No	-
100	BB	937657	-	-	62	66	-	-	-	-	-	-	-	14	14	-	-	-	-	-	-	-	6.1	5.8	-	-	-	-	-	-	No	-
101	D	885321	-	-	67	68	67	67	65	70	88	-	-	17	16	13	12	10	8	8	-	-	6	6.1	5	4.3	3.9	3.8	4.3	-	No	-
102	BK	811581	-	-	69	75	85	64	65	66	60	-	-	14	12	10	8	10	6	7	-	-	6	5.6	4.5	3.6	3.3	4	4.8	-	Yes	9
103	JS	155951	-	-	59	60	72	70	71	86	-	-	-	18	17	15	11	10	9	-	-	-	5.6	5.9	5.4	4.2	3.1	3.5	-	-	Yes	9
104	NKT	953350	94	-	64	61	66	67	65	72	68	69	-	11	11	10	9	8	5	4	-	-	6.2	6	4	4.5	4.3	4.4	4.2	4.1	No	-
105	NK	941462	-	-	67	67	63	65	64	59	-	-	-	15	15	13	11	10	9	-	-	-	6	6.3	4.8	4.6	4.4	3.4	-	-	Yes	9
106	DS	267354	88	-	66	65	61	67	68	75	67	61	-	15	15	13	8	9	7	5	-	-	6	6	3.9	3.9	4.1	3.6	4.6	3.7	No	-
107	SK	792283	102	-	66	63	67	66	74	78	76	82	-	16	13	12	14	12	10	9	-	-	7	6.5	3.6	4.2	3.8	4.2	3.1	4.5	Yes	5
108	M	922790	-	-	61	62	64	64	61	78	80	-	-	14	14	12	10	8	7	8	-	-	7	6.9	4.2	4.5	4	4.1	3.7	-	No	-
109	MK	928552	94	-	67	70	66	70	68	73	78	85	-	12	11	10	11	9	8	9	-	-	7	6.9	4.9	3.1	3.9	3.9	3.4	4.5	Yes	4
110	VK	941632	-	-	63	78	65	64	76	-	-	-	-	18	16	11	12	10	-	-	-	-	5.4	5.8	4.5	4	3.9	-	-	-	Yes	8
111	GS	481221	89	-	71	65	67	70	60	68	72	65	-	14	13	10	9	8	6	6	-	-	6	6.9	4.8	5.3	4.2	5.4	4.1	4	No	-
112	TD	962213	-	-	71	69	63	85	84	90	-	-	-	12	12	10	8	11	9	-	-	-	5.8	6	5.2	3.4	4	3.5	-	-	Yes	8
113	JS	773014	-	-	62	62	61	62	61	62	-	-	-	15	15	12	11	10	9	-	-	-	4.8	5	4.6	4.4	4.3	4.1	-	-	Yes	10
114	LS	792712	-	-	68	69	74	80	88	-	-	-	-	18	17	15	12	9	-	-	-	-	5	5.9	4.9	4.5	3.6	-	-	-	Yes	8
115	SK	803736	-	-	64	71	67	66	78	86	-	-	-	12	12	8	10	11	9	-	-	-	5.6	6	3.5	4.5	4.6	3.7	4	-	No	-
116	SN	565055	101	-	70	74	66	74	70	70	76	82	-	11	12	12	13	10	10	8	-	-	6.2	6	3.9	4.2	5.8	4.2	3.8	4.2	Yes	10
117	M	936343	96	-	70	72	80	68	70	72	76	78	-	11	11	10	9	8	6	5	-	-	6.3	4.5	4.2	4.9	4.5	4.6	4.5	4.3	No	-
118	VK	922058	-	-	61	62	-	-	-	-	-	-	-	15	14	-	-	-	-	-	-	-	6.9	7	-	-	-	-	-	-	No	-
119	SCB	449979	84	-	63	73	66	63	72	69	68	90	-	13	12	9	10	7	10	8	-	-	5	5.9	4.5	3.9	3.8	4.2	4.3	3.1	No	-
120	VKM	957708	-	-	64	66	64	77	78	88	-	-	-	16	16	15	14	10	8	-	-	-	6	5.6	3.4	3.9	3.5	3.7	-	-	Yes	5
121	BS	459530	-	-	66	68	65	75	76	85	-	-	-	17	17	16	12	11	9	-	-	-	5.5	5.9	3.4	5.4	4.3	4.1	-	-	Yes	8
122	PL	942200	-	-	63	60	62	64	63	62	60	-	-	17	15	12	10	9	8	5	-	-	6	5.8	5.2	4.9	4	3.5	3	-	Yes	10
123	A	804852	90	-	68	69	69	72	61	68	72	78	-	15	14	12	10	11	7	6	-	-	5.6	5.9	5.1	4.5	3.5	3.5	4.4	4	No	-
124	JS	371155	98	-	58	60	72	76	78	74	76	80	-	21	15	9	12	9	8	9	-	-	5.7	6	4.2	4.2	3.8	5.1	4.1	3.5	Yes	5
125	HK	933221	-	-	60	59	62	60	64	62	78	-	-	16	16	14	13	9	7	8	-	-	7	7.1	5.2	5.4	3.9	3.2	4.4	-	No	-
126	RD	724791	-	-	60	60	64	64	63	78	80	-	-	16	15	12	12	10	9	7	-	-	5	5.5	4.9	4	3.9	3.6	5.5	-	Yes	11
127	PK	791773	-	-	61	63	-	-	-	-	-	-	-	12	12	-	-	-	-	-	-	-	6.8	6	-	-	-	-	-	-	No	-
128	MRS	725970	92	-	68	78	66	64	69	70	72	80	-	18	16	9	7	8	6	-	-	-	4.5	6.3	3.8	3.9	3.7	3.9	3.8	3.5	Yes	6
129	PS	805249	-	-	65	76	65	72	64	-	-	-	-	16	16	14	12	11	-	-	-	-	6.8	6	4	3.8	4.3	-	-	-	No	-
130	RS	297707	-	-	63	64	75	60	62	63	-	-	-	15	15	12	10	11	10	-	-	-	6.4	6.1	5	5.1	4.5	4.4	-	-	Yes	4
131	KS	950886	-	-	68	66	62	75	69	66	-	-	-	16	15	13	12	12	10	-	-	-	5.6	5.6	3.9	3.6	3.2	3.2	-	-	Yes	4
132	MS	944258	-	-	60	58	-	-	-	-	-	-	-	15	14	-	-	-	-	-	-	-	5.8	7.2	-	-	-	-	-	-	Yes	1

Serial no.	Name	MRD	Total days on vasopressors	Cumulative vasopressor dose	Norepinephrine (mcg/min)	Vasopressin (cumulative units)	Dobutamine in grams	Death	ICU type medical-surgical-, cardiovascular /CCU	Survival at 14 days after RRT	14 day mortality rate	14 day mortality rate after RRT	30 day mortality rate	All cause intra hospital mortality rate (last contact)	Days until death	days until discharge	duration of CRRT in hours	Days on RRT (duration of RRT)	Dailysis free days	30 day RRT dependence	RRT switch	RRT Switch to	Serum creat at discharge/last contact in survivors; mg/dl)	Total UF (ML)	Anticoagulation
67	RKA	920843	12	-	680	290	-	Yes	1	No	No	Yes	Yes	Yes	16	-	72	8	8	-	2	-	-	8000	2
68	JS	806411	12	-	560	-	-	Yes	2	No	No	Yes	Yes	Yes	19	-	-	5	7	-	2	-	-	9000	2
69	PK	957243	9	-	760	-	4.4	Yes	1	No	Yes	Yes	Yes	Yes	11	-	-	5	6	-	2	-	-	11000	2
70	SS	31929	7	-	790	-	-	Yes	2	No	Yes	Yes	Yes	Yes	8	-	-	3	5	-	2	-	-	11000	2
71	KS	941424	11	-	540	370	8.8	Yes	1	No	Yes	Yes	Yes	Yes	11	-	74	3	-	-	2	-	-	12000	2
72	BL	184581	6	-	340	-	8.6	No	1	Yes	No	No	No	No	-	16	46	2	14	2	2	-	1.3	11000	2
73	BS	915489	11	-	840	340	-	Yes	1	No	No	Yes	Yes	Yes	15	-	48	4	12	-	2	-	-	10000	2
74	KL	93934	8	-	600	-	-	No	1	Yes	No	No	No	No	-	24	56	3	21	2	2	-	2	2000	2
75	KS	791824	8	-	540	-	-	Yes	1	No	Yes	Yes	Yes	Yes	9	-	-	3	6	-	2	-	-	9000	2
76	HS	918158	10	-	550	-	-	Yes	1	No	Yes	Yes	Yes	Yes	13	-	106	4	10	-	1	3	-	7000	2
77	GS	796052	14	-	820	-	-	Yes	2	No	Yes	Yes	Yes	Yes	8	-	-	4	4	-	2	-	-	8000	2
78	AS	969220	4	-	280	-	-	No	2	Yes	No	No	No	No	-	17	24	1	16	2	2	-	1.4	9000	2
79	HK	935004	10	-	450	410	5.1	No	1	Yes	No	No	No	No	-	28	52	7	21	2	1	1	1	7000	2
80	SS	958627	5	-	660	-	-	No	1	Yes	No	No	No	No	-	21	50	3	17	2	2	-	0.8	12000	2
81	DC	952484	10	-	860	-	-	Yes	1	No	Yes	Yes	Yes	Yes	11	-	-	4	7	-	2	-	-	11000	2
82	GS	449429	5	-	330	-	-	No	1	Yes	No	No	No	No	-	17	-	4	13	2	1	1	0.9	10500	2
83	KR	268515	8	-	660	-	-	Yes	2	No	Yes	Yes	Yes	Yes	10	-	48	2	8	-	2	-	-	10000	2
84	JK	952102	8	-	590	210	1.7	Yes	1	No	Yes	Yes	Yes	Yes	10	-	-	3	7	-	2	-	-	11000	2
85	GS	714651	10	-	490	-	3.4	No	1	Yes	No	No	No	No	-	19	150	7	12	1	1	2	4	9900	2
86	NK	467971	6	-	580	-	-	No	2	Yes	No	No	No	No	-	19	-	5	13	2	2	-	0.9	11000	2
87	MJ	949220	16	-	670	-	-	Yes	1	No	No	Yes	Yes	Yes	17	-	-	7	10	-	2	-	-	7000	2
88	P	916639	4	-	470	-	5.1	No	1	Yes	No	No	No	No	-	22	-	6	16	1	2	-	3.9	9000	2
89	SKM	776651	8	-	490	230	6.9	Yes	1	No	Yes	Yes	Yes	Yes	10	-	40	6	4	-	1	3	-	8000	2
90	JS	810544	6	-	450	-	-	No	1	No	No	Yes	Yes	Yes	16	-	-	4	10	-	2	-	-	11000	2
91	R	921003	7	-	774	370	-	Yes	2	No	Yes	Yes	Yes	Yes	7	-	46	2	5	-	2	-	-	9000	2
92	KD	802241	12	-	760	-	-	Yes	1	No	No	Yes	Yes	Yes	18	-	-	6	11	-	1	1	-	8900	2
93	HK	288463	7	-	490	-	5	Yes	1	No	Yes	Yes	Yes	Yes	7	-	120	5	2	-	2	-	-	7800	2
94	BK	980590	4	-	400	-	4	No	1	Yes	No	No	No	No	-	22	23	1	21	2	2	-	1	9800	2
95	BS	801356	5	-	690	-	-	Yes	2	No	Yes	Yes	Yes	Yes	6	-	-	1	5	-	2	-	-	8000	2
96	RA	192383	3	-	460	-	-	No	1	Yes	No	No	No	No	-	19	-	5	14	2	2	-	1.4	4000	3
97	JS	34271	5	-	250	-	-	No	1	Yes	-	No	No	No	-	14	-	3	11	1	2	-	4	9000	3
98	GK	976872	6	-	600	-	3.4	No	1	Yes	No	No	No	No	-	22	105	5	17	1	2	-	4.9	7500	3
99	HK	806097	12	-	680	-	-	Yes	2	No	No	Yes	Yes	Yes	21	-	-	5	16	-	2	-	-	8000	3
100	BB	937657	1	-	500	-	-	Yes	1	No	Yes	Yes	Yes	Yes	1	-	25	1	-	-	2	-	-	11000	3
101	D	885321	10	-	520	-	-	Yes	1	Yes	No	Yes	No	No	21	-	-	7	14	2	2	-	0.8	7800	0
102	BK	811581	10	-	550	260	-	Yes	2	No	Yes	Yes	Yes	Yes	14	-	-	5	9	-	2	-	-	10000	0
103	JS	155951	8	-	450	-	5.1	Yes	1	No	Yes	Yes	Yes	Yes	11	-	-	4	7	-	1	1	-	8000	0
104	NKT	953350	2	-	660	350	-	No	1	Yes	No	No	No	No	-	21	40	2	19	2	2	-	1.2	8000	0
105	NK	941462	9	-	540	380	-	Yes	1	No	Yes	Yes	Yes	Yes	9	-	48	2	-	-	2	-	-	9800	0
106	DS	267354	6	-	350	-	-	No	1	Yes	No	No	No	No	-	20	-	5	16	2	2	-	1.2	7800	0
107	SK	792283	6	-	590	-	1.7	No	1	Yes	No	No	No	No	-	22	-	6	16	2	1	1	4.5	5000	0
108	M	922790	8	-	560	-	-	Yes	2	No	No	Yes	Yes	Yes	17	-	98	4	13	-	1	3	-	7500	1
109	MK	928552	7	-	480	-	-	No	1	Yes	No	No	No	No	-	16	-	4	12	2	1	1	1.4	7000	0
110	VK	941632	8	-	440	-	-	Yes	1	No	Yes	Yes	Yes	Yes	8	-	80	3	-	-	2	-	-	9000	0
111	GS	481221	5	-	400	-	-	No	2	Yes	No	No	No	No	-	16	-	4	12	2	2	-	1.6	6000	0
112	TD	962213	10	-	570	-	-	Yes	1	No	Yes	Yes	Yes	Yes	13	-	-	5	8	-	1	3	-	9000	0
113	JS	773014	13	-	750	-	3.4	Yes	1	No	Yes	Yes	Yes	Yes	15	-	124	6	7	-	1	2	-	13000	0
114	LS	792712	9	-	450	-	-	Yes	1	No	Yes	Yes	Yes	Yes	9	-	-	4	5	-	2	-	-	6000	0
115	SK	803736	18	-	650	-	-	Yes	2	No	No	Yes	Yes	Yes	16	-	-	6	10	-	2	-	-	8000	0
116	SN	565055	7	-	850	172	1.7	No	1	Yes	No	No	No	No	-	22	100	5	17	1	1	2	5.4	9000	0
117	M	936343	9	-	600	382	-	No	1	Yes	No	No	No	No	-	16	80	5	11	2	1	2	1.2	7000	0
118	VK	922058	7	-	560	-	-	Yes	2	No	Yes	Yes	Yes	Yes	2	-	46	2	7	-	2	-	-	11000	0
119	SCB	449979	5	-	465	-	-	No	1	Yes	No	No	No	No	-	21	-	5	16	2	2	-	0.8	11000	0
120	VKM	957708	9	-	440	240	-	Yes	1	No	Yes	Yes	Yes	Yes	12	-	-	6	6	-	2	-	-	9000	0
121	BS	459530	8	-	580	-	6.9	Yes	1	No	Yes	Yes	Yes	Yes	11	-	-	6	5	-	2	-	-	4000	0
122	PL	942200	14	-	620	250	-	Yes	1	No	No	Yes	Yes	Yes	14	-	78	3	-	-	2	-	-	8600	0
123	A	804852	7	-	450	-	-	Yes	1	Yes	No	No	No	No	-	18	-	3	5	2	2	-	0.8	7800	0
124	JS	371155	11	-	560	-	-	No	1	Yes	No	No	No	No	-	22	72	7	15	1	1	1	4	9000	0
125	HK	933221	12	-	575	180	-	Yes	2	No	No	Yes	Yes	Yes	25	-	68	3	23	-	2	-	-	8900	0
126	RD	724791	14	-	650	-	-	Yes	1	No	No	Yes	Yes	Yes	18	-	100	4	14	-	1	3	-	9000	1
127	PK	791773	8	-	490	-	2	Yes	1	No	Yes	Yes	Yes	Yes	1	-	-	1	0	-	2	-	-	7000	0
128	MRS	725970	11	-	580	270	5.1	No	1	Yes	No	No	No	No	-	24	58	3	21	2	2	-	1.3	9000	0
129	PS	805249	9	-	580	270	-	Yes	2	No	Yes	Yes	Yes	Yes	13	-	-	4	9	-	1	3	-	8000	0
130	RS	297707	10	-	560	-	-	Yes	1	No	Yes	Yes	Yes	Yes	10	-	-	3	7	-	2	-	-	7000	0
131	KS	950886	12	-	580	-	-	Yes	1	No	Yes	Yes	Yes	Yes	11	-	-	4	7	-	2	-	-	12000	0
132	MS	944258	1	-	680	-	3.4	Yes	2	No	Yes	Yes	Yes	Yes	1	-	10	1	-	-	1	1	-	14000	0

Serial no.	Name	MRD	Age	Gender	Group	Etiology of Aki	Category	Baseline Hb (g/dl)	Premorbid creatinine(mg/dl)	Hco3 baseline	Need for vasopressor	SBP	DBP	Reason for AKI	DM	HTN	COPD	CAD	CKD	CHF	Neurology/post stroke	Malignancy	Pancreatitis	Indication of dialysis	SOFA score_	SOFA score day 0	SOFA score day 1	SOFA score day 3	SOFA score day 5	SOFA score day 7	SOFA score day 10	SOFA score day 14	SOFA score day 30	s. Creat	s.Creat_day 0	s.Creat_day 1
133	BK	969828	65	1	2	1	1	10.2	-	12	Yes	88	66	1	Absent	Absent	Absent	Absent	Absent	Present	Absent	Absent	Absent	3	-	15	15	13	12	11	11	9	-	-	7.4	8
134	KI	857421	59	2	3	6	1	8.5	-	13	Yes	100	64	1	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	2	-	18	18	17	12	8	9	7	5	-	8.6	9.8
135	MR	474984	65	1	2	1	1	9.2	-	19	Yes	90	60	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	12	13	11	12	10	9	6	4	-	11	11
136	TS	922508	65	2	1	11	1	11	-	15	Yes	90	60	2	Present	Present	Absent	Present	Absent	Absent	Present	Absent	Absent	2	-	16	16	-	-	-	-	-	-	-	5.8	6
137	RS	961959	68	1	1	4	1	11.2	-	18	Yes	100	64	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	12	12	11	10	9	6	4	4	-	12	11
138	S	787665	76	2	1	7	1	11	1.6	12	Yes	90	60	1	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Present	4	-	16	15	15	17	18	17	11	9	-	8.6	8.6
139	MK	990907	64	2	2	2	1	11	-	8	Yes	90	62	1	Present	Present	Absent	Present	Absent	Present	Present	Present	Absent	3	-	10	10	9	7	9	4	3	3	-	9.9	7.9
140	IS	939019	67	1	1	5	1	10.2	-	12	Yes	90	60	1	Absent	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	12	12	11	10	9	9	4	4	-	13.4	12
141	CS	871785	76	1	1	10	1	13	-	12	Yes	88	66	1	Absent	Absent	Absent	Absent	Absent	Present	Absent	Absent	Absent	3	-	18	17	15	15	16	17	-	-	-	6.4	6
142	M	780375	58	2	1	1	1	8.9	-	12	Yes	92	66	1	Present	Present	Absent	Absent	Present	Present	Absent	Absent	Absent	1	-	16	16	15	-	-	-	-	-	-	8.8	9
143	MS	919231	65	1	1	11	1	9.9	-	17	Yes	88	60	2	Absent	Absent	Absent	Present	Present	Absent	Absent	Absent	Absent	4	-	17	17	15	16	16	16	-	-	-	7.9	8
144	AS	616116	45	2	1	11	1	11.4	-	12	Yes	86	60	2	Present	Present	Absent	Present	Absent	Absent	Absent	Absent	Absent	4	-	16	16	15	15	-	-	-	-	-	7.3	7
145	MKV	970726	48	1	1	7	1	9.2	-	15	Yes	96	60	1	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	2	-	9	9	7	5	6	5	5	3	-	5.8	6
146	SK	944065	76	1	3	6	1	10	-	15	Yes	84	58	1	Absent	Present	Absent	Present	Present	Absent	Absent	Absent	Absent	4	-	12	19	17	15	16	16	11	-	-	7.3	7.6
147	JS	938983	56	2	1	1	1	9.6	-	16	Yes	88	48	1	Absent	Present	Absent	Absent	Absent	Absent	Absent	Absent	Present	1	-	10	10	12	9	8	6	5	5	-	9.5	9.5
148	VR	920946	65	2	1	10	1	11.8	-	15	Yes	86	62	1	Absent	Absent	Absent	Present	Present	Absent	Absent	Absent	Absent	2	-	16	16	15	15	16	8	8	-	-	6.4	7
149	KK	873789	50	1	2	3	1	11	-	9	Yes	86	60	1	Present	Present	Present	Absent	Present	Absent	Absent	Absent	Absent	3	-	13	14	14	12	-	11	7	4	-	7.4	7
150	DK	895091	67	1	1	11	1	11.2	-	12	Yes	86	64	2	Absent	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	3	-	16	17	15	15	8	9	10	-	-	6.9	7
151	BK	792701	76	1	2	7	1	10	-	13	Yes	86	64	1	Absent	Absent	Absent	Absent	Present	Absent	Present	Absent	Absent	2	-	15	15	13	11	8	9	-	-	-	11.9	12
152	KKA	232650	65	2	2	11	1	12	-	14	Yes	90	60	2	Present	Absent	Absent	Present	Present	Present	Absent	Absent	Absent	4	-	14	15	13	-	-	-	-	-	-	14	15.1
153	PG	447864	45	1	1	6	1	9.5	-	19	Yes	100	70	1	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	Absent	3	-	14	19	13	11	10	4	6	4	-	8	9
154	DK	426738	56	1	1	14	1	9.4	2	15	Yes	88	60	1	Absent	Absent	Absent	Present	Present	Absent	Absent	Absent	Absent	3	-	15	18	14	14	16	15	-	-	-	10.4	10
155	YS	784536	68	1	1	11	1	8.8	-	10	Yes	84	64	2	Present	Present	Present	Present	Absent	Absent	Absent	Absent	Absent	4	-	15	19	16	15	15	16	-	-	-	7.2	7.2
156	AK	224500	65	1	2	6	1	9	-	12	Yes	86	64	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	15	15	14	10	13	12	-	-	-	10.2	11
157	GK	937081	55	1	3	8	1	9.6	-	20	Yes	90	60	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	18	18	15	11	12	9	5	4	-	9	10
158	D	329217	45	1	2	2	1	9.2	-	12	Yes	90	60	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	12	11	11	9	9	9	7	4	-	8.8	7.8
159	NK	915527	70	1	1	6	1	10	-	12	Yes	86	64	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	17	17	15	15	16	16	11	10	-	9.3	9
160	MD	382985	59	2	2	7	1	9	-	14	Yes	88	56	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Present	Absent	1	-	13	12	11	9	8	8	6	5	-	10.3	9.9
161	SK	937061	57	1	3	6	1	10.5	3	7	Yes	90	60	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	19	19	15	15	-	-	-	-	-	7	6.8
162	RK	809720	68	1	2	4	1	12	-	10	Yes	98	60	1	Absent	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	4	-	13	13	11	10	9	7	7	6	-	10	10
163	BD	601246	67	2	1	1	1	8.9	2.4	11	Yes	90	64	1	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	3	-	17	17	16	8	9	10	-	-	-	9.8	10
164	RK	952186	45	1	2	2	1	9	-	12	Yes	86	66	1	Present	Present	Absent	Absent	Absent	Present	Present	Absent	Absent	2	-	13	14	13	13	9	11	-	-	-	10.9	7.9
165	SD	416502	58	1	2	11	1	12	3	10	Yes	90	65	2	Present	Present	Absent	Present	Present	Absent	Absent	Absent	Absent	4	-	12	11	10	9	7	5	5	4	-	13	8.6
166	VS	940029	54	2	1	1	1	8.6	-	18	Yes	88	50	1	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	Absent	2	-	10	10	12	9	8	8	5	4	-	8.1	9
167	MK	957221	76	1	1	1	1	12.5	-	19	Yes	98	64	1	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	Absent	4	-	11	11	10	9	8	9	7	3	-	7.4	8
168	GW	770976	48	1	1	11	1	10.6	-	12	Yes	90	56	2	Present	Present	Absent	Present	Present	Present	Absent	Absent	Absent	2	-	16	16	15	16	-	-	-	-	-	9.2	9
169	SS	944977	65	2	3	3	1	10.4	2.5	10	Yes	88	62	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	2	-	14	17	16	15	13	14	-	-	-	9.4	9.7
170	AS	937682	66	2	3	11	1	9.2	-	14	Yes	90	60	2	Present	Present	Absent	Present	Absent	Absent	Absent	Absent	Absent	3	-	14	17	16	14	15	14	12	-	-	10	11.2
171	MK	916994	67	2	1	11	2	11.2	2.5	14	Yes	90	68	2	Absent	Absent	Absent	Present	Present	Absent	Absent	Absent	Absent	4	-	16	16	15	15	16	17	-	-	-	7.4	8
172	IK	781230	72	2	1	1	1	7.8	-	10	Yes	88	62	1	Present	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	16	17	15	14	16	16	-	-	-	8.3	8
173	JB	960667	59	1	2	6	1	10	-	10	Yes	86	64	1	Absent	Absent	Absent	Absent	Present	Present	Absent	Present	Present	2	-	15	16	15	15	14	13	-	-	-	7.9	8
174	RG	948864	69	1	2	2	1	9	-	10	Yes	88	62	1	Present	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	15	14	14	13	-	12	-	-	-	9.3	9.8
175	AK	970358	67	1	1	4	1	8	-	9	Yes	98	60	3	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	9	9	10	10	8	6	6	5	-	6.5	6.5
176	VP	776796	80	1	1	7	1	11.2	-	11	Yes	86	62	1	Present	Present	Absent	Absent	Present	Present	Absent	Absent	Absent	3	-	16	16	-	-	-	-	-	-	-	13.8	13.8
177	MS	913728	56	1	1	3	1	9.7	-	16	Yes	88	64	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	16	15	15	14	10	9	-	-	-	6.7	7
178	AK	428738	68	2	1	1	1	8.6	-	11	Yes	90	60	1	Absent	Present	Present	Present	Absent	Absent	Absent	Absent	Present	2	-	16	16	15	15	16	17	-	-	-	7.6	8
179	AK	942444	71	2	3	1	1	8.6	-	11	Yes	90	60	1	Absent	Absent	Absent	Present	Present	Absent	Absent	Absent	Absent	2	-	14	20	18	15	14	14	-	-	-	7.9	7.6
180	OS	807317	70	2	2	9	1	9.7	2.2	14	Yes	80	62	1	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	4	-	15	15	14	14	13	11	-	-	-	9	8.8
181	SS	948851	61	1	2	6	1	10	1.6	11	Yes	92	62	1	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	3	-	14	15	13	12	10	9	9	-	-	10.4	8.8
182	GK	257292	60	2	1	1	1	11	-	15	Yes	96	62	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Present	2	-	14	17	12	11	12	7	7	3	-	9	10
183	GS	742168	67	2	1	11	2	12	-	10	Yes	98	60	2	Absent	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	1	-	12	12	10	9	8	5	6	5	-	10	10
184	AK	9649494	46	2	1	7	1	9.7	-	14	Yes	106	88	3	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	14	14	13	12	10	7	7	5	-	7.2	7
185	RPS	789234	67	1	1	9	1	11	3	13	Yes	92	60	1	Absent	Present	Absent	Absent	Present	Absent	Present	Present	Absent	4	-	15	14	13	14	15	16	-	-	-	6.9	7
186	RS	40348	54	2	2	11	1	11	2.8	14	Yes	96	65	2	Present	Present	Absent	Present	Present	Absent	Absent	Absent	Absent	4	-	12	11	13	5	5	6	7	5	-	7.9	6.9
187	BK	807335	58	2	2	6	2	11	-	14	Yes	84	60	1	Present	Absent	Absent	Absent	Present	Absent	Absent	Present	Absent	2	-	15	14	13	13	14	10	8	-	-	9	9.9
188	MK	769582	68	2	1	7	1	11	-	9	Yes	86	60	1	Present	Present	Present	Absent	Present	Absent	Absent	Absent	Absent	3	-	14	14	15	16	-	-	-	-	-	7.4	7.4
189	AS	77966	48	1	1	2	1	10.4	-	13	Yes	90	60	1	Absent	Present	Absent	Absent	Absent	Absent	Present	Absent	Absent	1	-	15	14	-	-	-	-	-	-	-	8.8	8
190	AK	66931	56	2	1	2	1	11	-	16	Yes	88	48	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	13	13	11	12	8	9	3	5	-	9	9
191	GS	587987	45	2	1	2	1	8.4	-	16	Yes	84	60	1	Present	Present	Present	Absent	Absent	Absent	Absent	Absent	Absent	3	-	15	16	14	15	-	-	-	-	-	6.4	6
192	HS	767206	60	2	3	7	1	11	1.9	14	Yes	100	62	1	Present	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	15	15	10	9	6	4	5	4	-	7	6.9
193	LS	922350	69	1	1	6	1	7.9	4.5	13	Yes	82	64	3	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	2	-	15	19	17	15	14	-	-	-	-	6.4	7
194	DP	885321	46	1	2	6	1	9.2	-	14	Yes	90	60	1	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	2	-	13	12	11	9	-	9	7	4	-	9.2	8.2
195	HS	794198	68	2	2	5	1	10.4	1.8	10	Yes	88	62	1	Absent	Absent	Present	Absent	Present	Absent	Absent	Absent	Absent	2	-	15	16	15	14	14	12	-	-	-	8.6	9
196	DD	614812	66	1	2	2	1	12	-	14	Yes	90	60	1	Present	Present	Absent	Absent	Present	Present	Absent	Absent	Absent	1	-	15	16	14	-	-	-	-	-	-	11.7	8.6
197	GK	798520	65	1	2	11	1	11.2	-	12	Yes	86	64	2	Absent	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	3	-	14	14	14	12	12	9	-	-	-	7.9	9
198	A	652157	54	1	2	3	1	11.2	-	18	Yes	100	64	2	Absent	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	4	-	12	11	10	8	7	8	6	4	-	8.5	9.5

Serial no.	Name	MRD	s.Creat_day 3	s.Creat_day 5	s.Creat_day 7	s.Creat_day 10	s.Creat_day 14	s.Creat_day 30	s. Urea	s.Urea_day 0	s.Urea_day 1	s.Urea_day 3	s.Urea_day 5	URR	s.Urea_day 7	s.Urea_day 10	s.Urea_day 14	s.Urea_day 30	UOP (24hrs)	UOP (24hrs) day 0	UOP (24hrs) day 1	UOP (24hrs) day 3	UOP(24hrs)_day 5	UOP(24hrs)_day 7	UOP(24hrs)_day 10	UOP(24hrs)_day 14	UOP(24hrs)_day 30	Ph	Ph_day 0	Ph_day 1	Ph_day 3	Ph_day 5
133	BK	969828	5.4	6.6	4.2	3.9	-	-	-	134	140	65	82	53.6	79	56	55	-	-	380	470	400	1450	1400	1550	1800	-	-	7.14	7.14	7.29	7.33
134	KI	857421	8.5	7.6	5.5	3.2	2.7	1.4	-	224	130	59	90	54.6	70	99	78	66	-	1200	600	800	1250	1650	1800	2500	2800	-	7.14	7.26	7.29	7.32
135	MR	474984	8.4	8.2	5.7	3.1	1.9	1.6	-	192	182	95	120	47.8	90	75	45	33	-	700	600	1650	1300	2750	1900	2125	2275	-	7.11	7.12	7.25	7.29
136	TS	922508	-	-	-	-	-	-	-	163	170	86	102	49.4	-	-	-	-	-	350	350	-	-	-	-	-	-	-	7.11	7.13	-	-
137	RS	961959	11	10.7	8	5.4	2.4	1	-	300	300	123	192	59.0	150	108	98	64	-	900	800	1050	1500	1800	2200	2300	2600	-	7.12	7.15	7.2	7.28
138	S	787665	7.5	6.4	4.8	5.5	4.6	4.4	3.2	165	165	70	90	57.6	88	109	112	98	102	450	450	800	550	500	600	900	1000	800	7.1	7.09	7.17	7.26
139	MK	990907	6	4.4	1.9	1.2	1.4	0.9	-	300	280	106	90	62.1	44	70	45	29	-	900	800	1200	1500	1950	2300	3000	3200	-	7.12	7.11	7.32	7.42
140	IS	939019	10.8	8.6	7.4	6.3	3.6	2	-	140	145	62	90	57.2	76	69	65	42	-	100	100	200	250	450	600	650	800	-	7.2	7.21	7.29	7.34
141	CS	871785	5.4	4.6	4.2	4	-	-	-	165	170	80	93	52.9	94	86	-	-	-	370	370	400	450	800	1400	-	-	-	7.12	7.14	7.29	7.23
142	M	780375	5.6	-	-	-	-	-	-	185	190	88	92	53.7	-	-	-	-	-	400	400	300	-	-	-	-	-	-	7.2	7.22	7.22	-
143	MS	919231	6.2	4.9	4.1	3.3	-	-	-	189	189	68	123	64.0	87	91	-	-	-	450	450	550	1500	1400	1300	-	-	-	7.12	7.15	7.2	7.25
144	AS	616116	6.9	5.2	-	-	-	-	-	187	187	105	59	43.9	-	-	-	-	-	300	300	350	800	-	-	-	-	-	7.01	7	7.12	7.24
145	MKV	970726	5.2	4.9	4.6	4.2	3.9	1.9	-	145	145	61	63	57.9	88	86	75	65	-	650	650	900	1550	1650	1850	2100	1800	-	7.2	7.23	7.28	7.32
146	SK	944065	6.8	5.7	4.6	4.1	6.4	-	-	178	178	86	114	51.7	102	97	86	-	-	500	300	200	550	400	500	250	-	-	7.14	7.16	7.23	7.28
147	JS	938983	7.5	6.5	5.5	3.5	2.8	1.8	-	195	200	91	90	54.5	130	110	70	44	-	400	500	600	650	1500	1850	2250	2400	-	7.1	7.11	7.25	7.26
148	VR	920946	5.8	5.2	4.7	3.4	5	-	-	198	198	93	103	53.0	85	56	89	86	-	350	350	400	570	400	600	800	950	-	7.08	7	7.16	7.19
149	KK	873789	6.5	5.4	4.8	4.5	5	3.4	-	197	197	101	100	48.7	98	65	49	42	-	400	350	400	450	290	320	800	600	-	7.2	7.2	7.22	7.24
150	DK	895091	5.7	4.9	3	6	4	-	-	164	164	75	35	54.3	60	88	100	-	-	450	450	500	575	1000	800	1000	-	-	7.12	7.13	7.17	7.28
151	BK	792701	7.2	6.3	5.5	4.5	-	-	-	147	148	78	82	47.3	50	88	-	-	-	400	500	400	400	600	350	600	-	-	7.15	7.16	7.19	7.41
152	KKA	232650	10.5	-	-	-	-	-	-	201	201	112	125	44.3	-		-	-	-	200	200	400	-	-	-	-	-	-	7.17	7.17	7.25	-
153	PG	447864	6.5	5.4	3.4	3.2	2.1	1.2	-	142	140	64	89	54.3	81	70	58	35	-	1200	1200	1400	1600	2000	2500	2800	3200	-	7.13	7.14	7.29	7.29
154	DK	426738	8.4	7.8	7.2	6.1	-	-	-	247	247	89	115	64.0	90	60	-	-	-	200	200	300	400	1350	1300	-	-	-	7.15	7.14	7.18	7.23
155	YS	784536	6.1	4.2	3.3	3.1	-	-	-	185	185	101	91	45.4	89	86	-	-	-	350	350	400	1300	1450	1000	-	-	-	7.1	7.1	7.19	7.34
156	AK	224500	7.1	6.4	6.1	4.6	4	-	-	189	189	90	90	52.4	13	112	89	-	-	450	350	400	800	950	800	575	-	-	7.11	7.11	7.16	7.28
157	GK	937081	7.4	6.4	5.4	4.1	2.3	0.6	-	184	184	69	94	62.5	80	75	55	36	-	800	1200	1150	1600	2550	2100	3500	3400	-	7.13	7.25	7.28	7.32
158	D	329217	6.5	6.3	3.6	2.4	1.8	1	-	190	180	102	100	43.3	100	68	45	46	-	500	400	600	750	1000	1400	1250	1300	-	7.1	7.12	7.15	7.29
159	NK	915527	8.4	6.4	5.2	4.6	4	2.1	-	212	212	81	150	61.8	140	114	96	86	-	350	350	1380	450	1475	1400	1575	900	-	7.1	7.11	7.16	7.28
160	MD	382985	8.5	7.2	7.5	3.2	1.9	1.2	-	278	272	143	110	47.4	98	60	75	56	-	900	1000	2000	1400	2500	1700	1850	2050	-	7.11	7.12	7.18	7.32
161	SK	937061	5.9	4.8	-	-	-	-	-	158	158	59	89	62.7	-	-	-	-	-	800	900	1500	1800	2500	2650	2700	2900	-	7	7.01	7.15	7.11
162	RK	809720	8.8	7.2	7.2	3.1	2.2	1.1	-	198	198	95	124	52.0	87	44	56	54	-	950	900	1050	1250	1700	1500	1200	-	-	7.18	7.18	7.36	7.28
163	BD	601246	7.9	7.2	6.8	5.5	-	-	-	150	160	70	105	56.3	77	45	-	-	-	250	250	300	550	1500	900	-	-	-	7.2	7.2	7.25	7.26
164	RK	952186	8.8	7.2	6.2	5.4	2	-	-	188	190	93	92	51.1	56	76	54	-	-	450	500	390	1320	1600	700	-	-	-	7.11	7.1	7.24	7.28
165	SD	416502	10.8	5.5	11.2	6	6	4.2	-	198	190	88	90	53.7	90	43	58	36	-	900	800	800	1200	1100	1900	1200	2500	-	7.11	7.12	7.26	7.31
166	VS	940029	6.5	6.2	5.5	3.5	2.8	0.8	-	217	217	100	100	53.9	90	65	58	45	-	1200	1200	1600	1750	2550	3350	3000	3000	-	7.21	7.23	7.27	7.29
167	MK	957221	6.9	5.6	4.5	3.4	2.4	1.1	-	196	196	102	110	48.0	95	88	57	44	-	600	700	750	900	1500	2500	2900	3200	-	7.11	7.14	7.3	7.32
168	GW	770976	8.6	7.5	-	-	-	-	-	265	170	67	125	60.6	-	-	-	-	-	550	550	325	650	-	-	-	-	-	7.21	7.26	7.29	7.32
169	SS	944977	6.4	5.4	4.5	3.2	-	-	-	198	198	105	118	47.0	124	99	-	-	-	400	800	550	1400	1500	1250	-	-	-	7.11	7.11	7.21	7.26
170	AS	937682	10.4	8.6	7.4	6.2	5.4	7.2	-	275	275	127	142	53.8	178	168	155	-	-	650	700	600	750	825	900	800	1500	-	7.1	7.1	7.2	7.29
171	MK	916994	6.4	4.7	4.1	3.9	-	-	-	185	185	65	120	64.9	106	97	-	-	-	200	200	720	250	1300	1650	-	-	-	7.11	7.1	7.15	7.16
172	IK	781230	6.4	6.2	5.4	4.9	-	-	-	200	198	75	124	62.1	100	95	-	-	-	250	250	600	1350	1480	1400	-	-	-	7.1	7.12	7.24	7.25
173	JB	960667	6.4	4.8	4.6	4.9	-	-	-	199	199	100	103	49.7	114	87	-	-	-	500	400	450	1500	1400	1300	-	-	-	7.09	7.1	7.19	7.36
174	RG	948864	7.1	8.2	5.4	4.9	-	-	-	176	180	102	93	43.3	100	76	-	-	-	400	500	300	1390	1350	1275	-	-	-	7.12	7.12	7.23	7.35
175	AK	970358	4.5	3.5	3.2	2.8	1.9	1.3	-	195	195	82	92	57.9	93	88	73	65	-	950	950	1000	1200	1600	1800	1850	1900	-	7.16	7.19	7.29	7.35
176	VP	776796	-	-	-	-	-	-	-	285	285	114	100	60.0	-	-	-	-	-	450	500	-	-	-	-	-	-	-	7.09	7.1	-	-
177	MS	913728	5.9	4.9	5.1	4.4	-	-	-	166	170	75	90	55.9	102	68	-	-	-	450	450	300	1350	1600	1500	-	-	-	7.09	7.1	7.16	7.25
178	AK	428738	6.5	5.5	4.9	4	-	-	-	196	200	86	90	57.0	78	101	-	-	-	350	350	400	700	1000	1420	-	-	-	7.1	7.1	7.18	7.24
179	AK	942444	6.5	5.5	4.9	4	-	-	-	196	200	86	144	57.0	152	142	-	-	-	400	700	400	1550	1400	1250	-	-	-	7.1	7.1	7.26	7.17
180	OS	807317	6.4	7.1	4.7	5	-	-	-	167	170	67	107	60.6	78	88	-	-	-	500	300	500	450	390	800	-	-	-	7.14	7.14	7.23	7.23
181	SS	948851	8	7.6	6.2	5.4	1.2	1.1	-	191	195	87	93	55.4	102	87	90	100	-	600	500	350	450	1450	1400	500	1000	-	7.11	7.14	7.16	7.25
182	GK	257292	7.5	6.4	5.4	3.4	4.7	3.1	-	210	211	93	116	55.9	87	65	52	42	-	1000	1000	1300	1400	1750	1950	2100	2400	-	7.2	7.21	7.29	7.32
183	GS	742168	8.8	7.2	5.2	3.1	3.2	4.1	-	272	275	112	130	59.3	98	54	75	60	-	800	900	1050	1250	1700	2500	2800	2900	-	7.15	7.18	7.26	7.28
184	AK	9649494	6.5	4.2	4.1	3.9	2.6	1.5	-	220	130	50	114	61.5	98	96	75	64	-	700	800	950	1250	1500	1800	2000	2200	-	7.1	7.11	7.27	7.3
185	RPS	789234	5.6	5.2	4.7	4.6	-	-	-	186	200	93	115	53.5	95	86	-	-	-	350	350	500	450	390	600	-	-	-	7.12	7.13	7.24	7.29
186	RS	40348	4.2	4.3	4.1	6.2	4.5	3.9	-	209	230	112	90	51.3	70	81	58	45	-	1000	900	500	800	850	900	1500	1850	-	7.14	7.16	7.28	7.44
187	BK	807335	7.2	8.4	4.8	8.8	3	-	-	201	201	104	104	48.3	65	55	-	-	-	500	500	400	450	550	600	-	-	-	7.13	7.14	7.24	7.37
188	MK	769582	6.5	5.4	4.8	-	-	-	-	185	185	88	115	52.4	90	-	-	-	-	350	350	400	800	425	-	-	-	-	7.2	7.2	7.22	7.24
189	AS	77966	-	-	-	-	-	-	-	217	200	118	110	41.0	-	-	-	-	-	400	400	-	-	-	-	-	-	-	7.12	7.13	-	-
190	AK	66931	7.2	5.1	3.4	2.9	1.9	1.4	-	150	150	78	94	48.0	76	58	45	58	-	900	900	950	1300	1650	1700	1750	1800	-	7.12	7.18	7.28	7.3
191	GS	587987	5	4.5	-	-	-	-	-	157	157	68	80	56.7	-	-	-	-	-	300	300	1350	650	-	-	-	-	-	7.12	7.15	7.19	7.25
192	HS	767206	5.6	5.4	4.5	4	3.8	2.5	-	175	180	86	110	52.2	98	90	88	60	-	500	500	700	1000	1100	1750	1100	1400	-	7.1	7.22	7.26	7.28
193	LS	922350	5.8	4.7	4.1	-	-	-	-	186	200	96	120	52.0	67	-	-	-	-	50	400	450	1000	1300	-	-	-	-	7.1	7.11	7.28	7.3
194	DP	885321	10.4	8.6	7.4	6.2	5.4	1.2	-	197	197	103	158	47.7	150	107	78	59	-	450	500	400	500	300	350	150	400	-	7.21	7.12	7.21	7.29
195	HS	794198	6.4	4.5	3.4	4	-	-	-	187	190	72	156	62.1	76	68	88	-	-	400	400	480	450	400	700	600	-	-	7.1	7.11	7.29	7.36
196	DD	614812	10.5	-	-	-	-	-	-	98	98	43	76	56.1	-	-	-	-	-	600	700	250	-	-	-	-	-	-	7.1	7.11	7.25	-
197	GK	798520	5.7	3.9	3	4	-	-	-	154	154	87	44	43.5	70	88	67	-	-	450	350	500	800	600	700	500	-	-	7.11	7.13	7.07	7.18
198	A	652157	11	9.7	8	4.4	2.4	1	-	201	220	99	94	55.0	39	76	56	44	-	900	1000	1300	1500	1800	2200	1200	1700	-	7.05	7.05	7.2	7.18

Serial no.	Name	MRD	Ph_day 7	Ph_day 10	Ph_day 14	Ph_day 30	Lactate	Lactate_ day 0	Lactate_d ay 1	Lactate_d ay 3	Lactate_d ay 5	Lactate_d ay 7	Lactate_d ay 10	Lactate_d ay 14	Lactate_d ay 30	S HCO3	S HCO3_day 0	S HCO3_da y 1	S HCO3_da y 3	S HCO3_da y 5	S HCO3_da y 7	S HCO3_da y 10	S HCO3_da y 14	S HCO3_da y 30	HR	HR_day 0	HR_day 1	HR_day 3	HR_day 5	HR_day 7	HR_day 10	HR_day 14
133	BK	969828	7.35	7.38	7.31	-	-	4	4.9	4	1	2.2	1.9	2.5	-	-	9.4	9.4	15.1	15.4	18.1	18.3	16.5	-	-	109	128	120	126	98	78	98
134	KI	857421	7.33	7.35	7.39	-	-	12.4	7.4	3.3	2.2	1.9	1.3	1.7	1	-	10	9	15.9	15	20.1	19	23	19	-	112	100	95	107	98	96	94
135	MR	474984	7.33	7.35	7.35	7.38	-	6	6.8	4	3.2	1	2.1	1.2	0.8	-	10	14	19.5	18.3	22	21.1	24.9	21	-	108	104	104	108	104	98	94
136	TS	922508	-	-	-	-	-	6	6.5	-	-	-	-	-	-	-	8.4	9	-	-	-	-	-	-	-	120	116	-	-	-	-	-
137	RS	961959	7.29	7.3	7.32	7.42	-	8.2	8	3.2	1.4	1.6	1.3	1.4	0.3	-	8	8.9	13.4	16.5	16.4	19.3	21.7	26.6	-	115	100	96	100	98	94	92
138	S	787665	7.29	7.29	7.29	7.23	7.35	7	7.7	4	2.4	3.2	2.3	2	3.2	2	11	11	11.2	15.9	14	13.3	10	8	8	124	128	122	128	126	138	112
139	MK	990907	7.32	7.26	7.29	7.32	-	7	8	4	1	1.4	1	1.4	1	-	11	10	19.4	21.1	18	18.2	21.5	22	-	106	98	96	110	96	86	84
140	IS	939019	7.32	7.35	7.39	7.34	-	7	7.9	2.4	1.6	1.7	0.9	1.2	1.2	-	6.6	6.6	16.7	15.8	19.5	16	18	20.2	-	116	106	104	110	106	98	92
141	CS	871785	7.35	7.28	-	-	-	3	3.5	4.7	1.9	2.2	2.9	-	-	-	8	8.5	14.1	15.4	17.1	18.3	-	-	-	130	130	120	126	97	98	-
142	M	780375	-	-	-	-	-	7	7.9	5.5	-	-	-	-	-	-	9	12	13	-	-	-	-	-	-	135	126	114	-	-	-	-
143	MS	919231	7.28	7.31	-	-	-	5.6	5	2.5	3.9	3.4	2.6	-	-	-	9	11	18	17.8	16.8	17.3	-	-	-	130	118	112	120	110	105	-
144	AS	616116	-	-	-	-	-	5.6	5	2.6	3.4	-	-	-	-	-	6	6.4	12.8	13.5	-	-	-	-	-	103	130	124	100	-	-	-
145	MKV	970726	7.36	7.39	7.42	7.28	-	5.6	5	6.5	3	1.9	1.8	1.4	1	-	11	12	18.4	22	15.8	14.2	15.9	21	-	103	94	94	102	98	100	96
146	SK	944065	7.3	7.39	7.33	-	-	14.4	13	5	3	4.4	2.3	3.3	-	-	9.7	9.5	10.7	8.6	14.6	13.8	9.1	-	-	120	126	125	130	111	110	104
147	JS	938983	7.32	7.34	7.31	7.28	-	8.4	8	3.2	1.3	1.6	0.9	1.4	1.2	-	8	9	16.9	16	21.5	16.4	16.2	18.3	-	110	98	98	102	98	90	86
148	VR	920946	7.28	7.3	7.32	7.4	-	7.7	7	4.3	1.9	2	3	2.2	-	-	9.9	10	14.9	17.7	20.2	16	17	-	-	134	124	120	120	126	100	98
149	KK	873789	7.35	7.24	7.47	7.29	-	7	8.7	3	4.8	2	1	1.4	0.3	-	12	12	18.4	22	16	15	15	20	-	130	126	122	128	122	110	88
150	DK	895091	7.3	7.44	7.32	-	-	8.4	8	3.2	1.4	1.9	1.5	1.5	-	-	7	7.9	8.3	12	17	18	14	-	-	138	132	122	130	112	112	102
151	BK	792701	7.34	7.45	7.34	-	-	6	5.9	6.7	4.6	5	4.3	4	-	-	9.9	10	14.9	19	18	14	19	-	-	130	120	94	112	110	98	88
152	KKA	232650	-	-	-	-	-	5.8	6	2.3	-	-	-	-	-	-	9.3	9.3	13.5	-	-	-	-	-	-	130	110	116	-	-	-	-
153	PG	447864	7.32	7.35	7.36	7.39	-	7.2	7	4.4	3.8	3.1	2.7	2.1	1.5	-	9	11	17.6	18.1	18.3	22.2	24.9	19.4	-	112	102	102	106	100	96	94
154	DK	426738	7.3	7.35	-	-	-	3.3	3	2.5	4.1	3.5	2.6	1.8	-	-	9	11	13.5	17.3	21.2	19.4	-	-	-	128	120	116	114	112	110	-
155	YS	784536	7.32	7.33	-	-	-	7.9	7	3.9	3	2	1.6	-	-	-	10	11	15	14.3	16.9	18.2	-	-	-	134	130	126	98	97	103	-
156	AK	224500	7.33	7.34	7.42	-	-	5.7	6	3.5	2	2.4	1.9	1.2	-	-	9	10.5	18.3	25.8	19.4	22.2	19.4	-	-	109	108	120	122	112	100	98
157	GK	937081	7.35	7.33	7.35	-	-	7	4.8	4.1	2.3	1.6	1.1	1.7	1.3	-	11	11.5	15	19	21.5	18.3	18	21	-	100	88	88	100	94	92	90
158	D	329217	7.3	7.48	7.37	7.33	-	5	4.8	2.3	2	2	1.9	1	1.3	-	11	9	18.8	12.5	20.2	17	20.2	21	-	104	106	104	108	104	90	100
159	NK	915527	7.23	7.34	7.32	7.44	-	4.8	4	5.3	2	3.4	1.9	2	3	-	8	11	18.3	20.8	13	21	19	18	-	101	114	120	130	98	102	104
160	MD	382985	7.45	7.26	7.37	7.35	-	4	3.5	1	2	1.6	1	1	1.3	-	8	10	13	18	17.9	17.2	18	19	-	112	100	96	102	108	102	100
161	SK	937061	-	-	-	-	-	6.3	6.9	5.5	9.6	-	-	-	-	-	9	10	10.4	11.5	-	-	-	-	-	98	116	112	123	-	-	-
162	RK	809720	7.39	7.47	7.37	7.35	-	4	3.6	1.8	2.2	1.6	2	1	1.3	-	10	9.4	12.3	18.3	19.9	18.2	20.1	19.4	-	134	110	110	110	100	94	90
163	BD	601246	7.28	7.38	-	-	-	6	6.5	5.6	2.3	1.9	2.4	-	-	-	7.8	8	11.1	12.9	17.2	18.6	-	-	-	138	132	126	108	100	98	-
164	RK	952186	7.26	7.35	-	-	-	9	10.1	8.8	4.6	4.1	3.2	4.4	-	-	11	11.1	19.4	18.7	13.6	15.9	-	-	-	110	100	108	98	102	98	-
165	SD	416502	7.4	7.43	7.33	7.41	-	4	3	2	2	2	1	0.8	1	-	13.9	14	19	21	21	19	17	21	-	98	90	90	96	98	101	98
166	VS	940029	7.36	7.32	7.31	7.33	-	7	7.9	1.5	1.8	2	1.8	1.3	1	-	11	11	14.2	20.2	21	23	18.3	20.8	-	110	94	94	104	100	98	96
167	MK	957221	7.35	7.36	7.37	7.35	-	7.5	7	2.9	1.5	1.8	2	1.2	0.4	-	15	15	18.5	21	22.1	19	25.8	24.1	-	100	88	88	88	86	90	88
168	GW	770976	-	-	-	-	-	9.6	9	7.9	3.2	-	-	-	-	-	10.9	10.9	16	12.2	-	-	-	-	-	126	126	124	126	-	-	-
169	SS	944977	7.28	7.37	-	-	-	5	5.5	2.3	5	3.2	2.1	-	-	-	8.2	10.4	12.2	14.3	8.6	10.4	-	-	-	100	130	119	126	108	104	-
170	AS	937682	7.32	7.29	7.26	-	-	10.8	8.8	8	6	5	4	2	3	-	14.3	16	13.8	12.2	11.1	9.1	9.7	8.6	-	102	118	118	128	124	102	112
171	MK	916994	7.22	7.28	-	-	-	7.9	7	3	2.4	3.2	1.9	-	-	-	5	16.6	11.6	18.1	17.3	18.2	-	-	-	130	124	122	92	98	100	-
172	IK	781230	7.29	7.34	-	-	-	7	7.9	4	1.9	1	2.3	-	-	-	10	12	15.8	18.5	10.2	13	-	-	-	112	118	118	96	98	110	-
173	JB	960667	7.25	7.31	-	-	-	5.4	5	2.3	3	3.5	1.9	-	-	-	12	12.3	19.4	22.5	18.3	19.5	-	-	-	108	118	118	78	96	98	-
174	RG	948864	7.39	7.34	-	-	-	11	10	3.1	1.9	1.7	1.3	-	-	-	10	10.1	18.8	19.5	10.2	13.6	-	-	-	120	114	118	118	104	102	-
175	AK	970358	7.36	7.34	7.34	7.41	-	6.2	6	2.9	2.5	2	1.9	1.5	0.8	-	11.9	11.9	16	20	17	22.2	17.9	21	-	102	92	92	96	98	86	80
176	VP	776796	-	-	-	-	-	5.6	5	-	-	-	-	-	-	-	9	11	-	-	-	-	-	-	-	134	132	-	-	-	-	-
177	MS	913728	7.24	7.22	-	-	-	8	8.4	3.2	3.3	4.4	5.4	-	-	-	10	11	16.8	20.6	16	18	-	-	-	100	118	116	124	110	98	-
178	AK	428738	7.34	7.31	-	-	-	8	8.7	3.5	2	3.4	3.2	-	-	-	8	11	16.5	17.2	17.6	18.3	-	-	-	102	132	122	100	87	98	-
179	AK	942444	7.23	7.31	-	-	-	13	4.2	11	3	5	4	-	-	-	13	10	9.7	8.6	10.7	8.6	-	-	-	142	132	122	98	102	104	-
180	OS	807317	7.24	7.43	-	-	-	8	9	3.1	2.2	2	1.9	-	-	-	8.3	9	11.5	12.2	14.3	19	-	-	-	128	118	122	112	102	98	-
181	SS	948851	7.31	7.24	7.37	7.3	-	4	3.6	2.3	1	4.1	3.2	4.4	4	-	12	12.5	15.9	10.2	8.8	15.9	18.3	17	-	120	124	128	130	110	108	112
182	GK	257292	7.34	7.35	7.34	7.38	-	7.4	7	2.3	1.6	1.8	0.9	1.2	1	-	9	9.4	15.2	17.8	20	18.6	18.2	20.4	-	114	102	94	100	94	96	96
183	GS	742168	7.39	7.37	7.37	7.25	-	3.5	3	1.8	2	1.6	1.4	1	1.3	-	10	10	12.3	17.3	19.9	17.2	18.1	17.4	-	110	102	104	110	98	94	90
184	AK	9649494	7.33	7.37	7.38	7.38	-	8.6	8	3.5	2.8	2.4	1.9	1.7	1.2	-	9	11	17	16.4	18.8	19.4	19.8	17.7	-	108	106	92	102	98	94	92
185	RPS	789234	7.3	7.32	-	-	-	8.4	8	3.2	1.9	2.5	1.6	-	-	-	10	11	17	17.9	26.5	21.1	-	-	-	120	116	112	118	100	98	-
186	RS	40348	7.32	7.27	7.28	7.35	-	7	8.4	4	2	2	2	1	1	-	10	9.8	15	20	21	22	17	21	-	98	95	91	89	105	98	97
187	BK	807335	7.24	7.44	7.44	-	-	15	14	7.8	3.7	2	2.3	1	-	-	10.3	11	18.2	20.2	15.8	12.5	-	-	-	136	120	118	128	132	86	88
188	MK	769582	7.35	-	-	-	-	6.5	6	5.6	4.5	3.5	-	-	-	-	9.5	9.5	12.3	8.8	18.3	-	-	-	-	124	130	126	132	126	-	-
189	AS	77966	-	-	-	-	-	9	9.6	-	-	-	-	-	-	-	7	7.7	-	-	-	-	-	-	-	130	128	-	-	-	-	-
190	AK	66931	7.35	7.36	7.39	7.39	-	8.5	8	4	3.6	2	1.4	1.1	1	-	8	10	14	17	20.1	23	21.5	19	-	114	106	110	112	100	98	96
191	GS	587987	-	-	-	-	-	8.7	8	3.5	4.8	-	-	-	-	-	9	9.5	14.9	10.2	-	-	-	-	-	108	120	116	104	-	-	-
192	HS	767206	7.3	7.32	7.38	-	-	6.7	7.5	4	3.6	2.1	1.7	1.6	1.2	-	7	8	16	17	23.2	19	23	23	-	100	86	86	92	94	90	88
193	LS	922350	7.31	-	-	-	-	8	8.4	3.2	2	1.8	-	-	-	-	12	12	13.5	13.3	11.2	-	-	-	-	125	130	130	88	100	-	-
194	DP	885321	7.32	7.29	7.35	7.3	-	5	4.2	4.8	4	2.8	3	1.6	0.8	-	8	8	15	16	10.2	14	23	21	-	123	114	118	120	100	98	100
195	HS	794198	7.28	7.4	7.35	-	-	7	7.6	3.4	2.2	1.7	2	1.2	-	-	8.5	9	10.1	8.8	14.3	15	17	-	-	124	112	104	97	112	104	98
196	DD	614812	-	-	-	-	-	6	5	1.6	-	-	-	-	-	-	9.3	9	13.5	-	-	-	-	-	-	130	130	129	-	-	-	-
197	GK	798520	7.28	7.33	7.34	-	-	6.8	6	3.2	1.4	4.9	4	3	-	-	7.9	7.9	8.3	11.5	18	14	11	-	-	139	129	122	112	110	100	98
198	A	652157	7.29	7.3	7.42	7.42	-	10	9	3.2	2.2	1.6	1.3	1.4	1	-	11.5	11.5	18.3	16.5	19.5	20.8	21.7	22.1	-	126	116	116	100	106	94	92

Serial no.	Name	MRD	HR_day 30	MAP	MAP_day 0	MAP_day 1	MAP_day 3	MAP_day 5	MAP_day 7	MAP_day 10	MAP_day 14	MAP_day 30	CVP	CVP_day 0	CVP_day 1	CVP_day 3	CVP_day 5	CVP_day 7	CVP_day 10	CVP_day 14	CVP_day 30	s. K	S.K_day 0	S.K_day 1	S.K_day 3	S.K_day 5	S.K_day 7	S.K_day 10	S.K_day 14	S.K_day 30	Need for mechanical ventilation.	Total days on mechanical ventilation
133	BK	969828	-	-	69	77	66	80	64	71	64	-	-	15	15	13	11	10	10	8	-	-	5.9	6	5	3.4	3.6	4	3.9	-	Yes	4
134	KI	857421	92	-	85	85	70	77	66	84	88	80	-	9	9	8	7	10	7	8	-	-	5.9	6.3	4.7	4.5	4	3.9	3.7	3.8	No	-
135	MR	474984	98	-	69	67	70	68	70	66	65	79	-	14	14	9	8	9	7	6	-	-	6.5	6	3.9	3.8	3.6	3.9	4.8	4.1	No	-
136	TS	922508	-	-	62	64	-	-	-	-	-	-	-	15	15	-	-	-	-	-	-	-	6	5.8	-	-	-	-	-	-	No	-
137	RS	961959	84	-	63	67	71	72	74	75	67	78	-	10	10	9	8	7	7	6	-	-	5	5.4	4	3.9	3.8	3.6	3.6	3.7	No	-
138	S	787665	98	110	60	60	64	65	63	60	68	76	75	13	12	10	9	7	6	6	8	6	5	5.7	4.9	4.4	3.9	3.5	3.4	4.4	Yes	10
139	MK	990907	92	-	68	70	67	80	70	84	90	78	-	9	8	10	8	7	8	7	-	-	6.4	6	4.9	4.3	4	3.2	3.4	4.3	Yes	8
140	IS	939019	88	-	66	74	86	68	74	72	75	76	-	10	10	9	6	8	7	8	-	-	6	6.3	3.8	4.6	3.8	3.6	3.3	3.2	Yes	8
141	CS	871785	-	-	63	62	63	65	64	65	-	-	-	14	13	11	9	9	8	-	-	-	6	6.3	5.4	5	4.7	4	-	-	Yes	9
142	M	780375	-	-	63	61	66	-	-	-	-	-	-	15	14	11	-	-	-	-	-	-	6	6.2	5	-	-	-	-	-	Yes	1
143	MS	919231	-	-	61	62	64	64	63	60	-	-	-	14	14	12	10	10	7	-	-	-	6.3	6	4.2	4.6	4.2	3.6	-	-	Yes	10
144	AS	616116	-	-	61	60	61	62	-	-	-	-	-	16	15	13	9	-	-	-	-	-	6.7	7	5.5	5.2	-	-	-	-	No	-
145	MKV	970726	88	-	60	63	65	66	67	65	68	86	-	10	10	9	10	8	9	11	-	-	5.7	6	3.5	3.2	3.6	3.8	4.8	3.9	Yes	5
146	SK	944065	-	-	65	66	66	64	63	62	76	-	-	17	16	12	10	8	6	5	-	-	5.7	6.5	4.9	3.5	3.9	3.6	4.2	-	Yes	7
147	JS	938983	78	-	62	67	68	80	69	68	76	70	-	13	14	12	11	9	10	8	-	-	5.4	6	4	3.5	3.6	3.5	3.9	4.3	Yes	6
148	VR	920946	-	-	61	62	64	65	64	76	80	-	-	14	13	10	9	8	8	9	9	-	5.9	6	5	4.2	3.4	3.1	4.4	5	Yes	9
149	KK	873789	98	-	63	64	77	69	72	64	80	88	-	13	13	10	8	6	5	5	-	-	6.9	6.4	4.2	4.9	4.4	3.4	5.4	5.4	No	-
150	DK	895091	-	-	63	64	65	64	94	80	78	-	-	15	15	12	9	9	8	10	-	-	6.2	6	5.2	4.9	4.6	4.1	4	-	Yes	8
151	BK	792701	-	-	60	61	69	64	90	86	88	-	-	14	13	10	9	10	8	9	-	-	6.2	6	3.8	3.9	3.4	3.8	3	-	No	-
152	KKA	232650	-	-	66	70	61	-	-	-	-	-	-	14	14	15	-	-	-	-	-	-	7.3	7	4.6	-	-	-	-	-	Yes	5
153	PG	447864	94	-	65	68	70	70	71	75	78	78	-	12	12	11	10	8	7	5	-	-	7	7	5.5	3.9	4.2	4.5	4.6	5.2	No	-
154	DK	426738	-	-	61	60	64	63	64	63	78	-	-	16	16	14	12	10	7	-	-	-	5.5	5	4.5	4.1	3.7	3.5	-	-	Yes	6
155	YS	784536	-	-	67	60	62	63	63	62	-	-	-	16	15	12	10	9	7	-	-	-	6.3	6	3.9	5.5	4.7	4.5	-	-	Yes	6
156	AK	224500	-	-	62	78	64	81	65	69	78	-	-	13	12	11	8	7	5	6	-	-	6	6.1	4.9	5.5	3.8	4.5	3.3	-	No	-
157	GK	937081	88	-	67	76	68	64	70	68	70	80	-	14	13	9	8	7	8	7	-	-	5.1	7.3	4.2	4.4	3.8	3.1	3.4	3.6	No	-
158	D	329217	89	-	67	72	73	75	68	71	78	83	-	10	10	9	8	9	6	7	-	-	7.1	7	4.3	3.4	3.4	4	3.4	3.9	No	-
159	NK	915527	98	-	62	62	66	65	65	61	60	86	-	15	14	13	10	9	7	7	8	-	5.9	5.5	4.9	4.5	3.8	3.5	3.3	4.4	Yes	13
160	MD	382985	100	-	62	71	62	76	68	62	64	88	-	14	13	10	11	8	7	9	-	-	5.8	6	4.7	3.8	3.9	3.4	3.4	4	No	-
161	SK	937061	-	-	66	70	68	70	68	72	78	80	-	6	6	11	10	-	-	-	-	-	6.8	6.2	5.1	4	-	-	-	-	No	-
162	RK	809720	92	-	69	80	60	62	66	69	65	66	-	10	10	8	7	8	6	5	-	-	5.5	5.5	2.5	3.5	4	3	3.5	5.4	Yes	5
163	BD	601246	-	-	60	58	60	76	86	80	-	-	-	15	14	10	10	8	7	-	-	-	6	6.2	5.1	4.5	4.1	3.7	-	-	No	-
164	RK	952186	-	-	67	66	71	62	74	84	-	-	-	13	12	9	7	8	8	6	-	-	6.4	6.6	5	4.4	4	3.5	-	-	Yes	7
165	SD	416502	97	-	74	72	69	67	79	68	78	84	-	11	10	9	11	8	9	6	-	-	6.5	6	3.2	4.1	4.9	4.6	4.3	4.1	Yes	10
166	VS	940029	94	-	68	75	62	70	64	70	79	85	-	10	10	9	8	9	7	6	-	-	5	4.5	4.2	3.9	3.8	3.7	3.6	3.5	Yes	8
167	MK	957221	86	-	70	75	66	63	68	75	70	78	-	8	8	7	7	8	8	7	-	-	6	5.6	4.9	3.5	3.6	3.8	3.9	4.2	No	-
168	GW	770976	-	-	64	62	64	64	-	-	-	-	-	13	13	12	10	-	-	-	-	-	6	6.8	3	4.2	-	-	-	-	Yes	7
169	SS	944977	-	-	60	68	64	70	63	68	-	-	-	4	13	10	9	8	6	-	-	-	6.1	6.8	5.6	5	4.2	3.9	-	-	Yes	9
170	AS	937682	-	-	66	71	62	63	64	62	59	-	-	14	13	10	11	9	7	6	-	-	5.8	5.7	5	4.5	4.2	3.8	3.3	-	Yes	11
171	MK	916994	-	-	64	64	65	65	66	64	-	-	-	15	15	13	12	10	9	-	-	-	7.4	7	6.8	5.6	4.7	4	-	-	Yes	6
172	IK	781230	-	-	60	62	63	64	63	61	-	-	-	14	14	12	11	10	8	-	-	-	6	6.4	4.8	4.5	4.1	3.9	-	-	Yes	8
173	JB	960667	-	-	66	84	64	70	69	63	-	-	-	13	12	10	9	7	5	-	-	-	6	6.1	4.9	4.3	4	4.1	3.6	-	Yes	5
174	RG	948864	-	-	69	70	72	71	66	69	-	-	-	16	16	14	13	12	6	-	-	-	6	5.9	4.6	4.5	5.6	4.5	-	-	Yes	8
175	AK	970358	78	-	63	66	64	68	66	78	68	80	-	14	14	13	11	10	9	9	-	-	6.2	6	4.9	3.7	3.5	3.7	3.8	3.9	No	-
176	VP	776796	-	-	58	58	-	-	-	-	-	-	-	14	14	-	-	-	-	-	-	-	6.9	6	-	-	-	-	-	-	Yes	2
177	MS	913728	-	-	62	60	62	64	78	80	-	-	-	14	14	12	10	9	8	-	-	-	6	6.5	5.2	4.9	4	3.5	3	-	Yes	8
178	AK	428738	-	-	63	60	62	63	62	60	-	-	-	15	15	13	12	10	9	-	-	-	7	7.4	4.3	5.4	4.2	3.8	-	-	Yes	8
179	AK	942444	-	-	65	71	73	69	62	60	-	-	-	15	15	13	12	10	9	-	-	-	7	7.1	6.3	5.4	4.2	3.8	-	-	Yes	8
180	OS	807317	-	-	68	84	88	64	61	88	-	-	-	14	16	11	9	6	-	-	-	-	5.9	6	3	4	3.9	3.7	4	-	No	-
181	SS	948851	90	-	71	72	79	68	88	76	88	90	-	11	11	9	8	12	10	8	-	-	6.2	6.1	5.4	4.6	3.9	5.1	4.7	5.7	Yes	5
182	GK	257292	94	-	60	66	62	61	62	68	71	65	-	13	12	11	10	9	8	8	-	-	7.4	7	5.5	3.9	3.5	3.4	3.4	3.4	No	-
183	GS	742168	88	-	70	72	62	76	63	60	68	79	-	13	12	10	9	8	6	4	-	-	6.5	6	5.5	5	4.6	4.2	3.5	3.4	Yes	5
184	AK	9649494	86	-	64	68	62	66	60	67	72	68	-	15	15	12	11	10	8	6	-	-	7	7.9	3.8	3.9	4.2	4.5	4.1	3.9	No	-
185	RPS	789234	-	-	62	61	64	65	63	60	-	-	-	13	13	11	10	10	8	-	-	-	5.9	6	4.7	3.6	3.3	3.2	-	-	Yes	10
186	RS	40348	104	-	67	72	60	76	69	65	71	76	-	11	10	14	12	15	10	12	-	-	6	6.2	3.2	3.3	4.5	4.1	5.4	3.4	Yes	6
187	BK	807335	-	-	68	78	63	64	60	86	78	-	-	15	16	12	11	9	8	8	-	-	7.4	7	4.4	4.5	4.1	3.8	4	-	No	-
188	MK	769582	-	-	61	61	62	64	62	-	-	-	-	15	15	12	10	8	-	-	-	-	6.9	7	4.2	4.9	4.4	-	-	-	Yes	10
189	AS	77966	-	-	64	64	-	-	-	-	-	-	-	14	14	-	-	-	-	-	-	-	6	6.6	-	-	-	-	-	-	Yes	7
190	AK	66931	96	-	62	74	71	72	76	74	80	76	-	12	11	10	8	7	6	5	-	-	6.2	6	4.5	3.8	3.9	4.6	4.8	5.1	No	-
191	GS	587987	-	-	62	64	65	64	-	-	-	-	-	14	13	10	9	-	-	-	-	-	6.5	7	4.7	4.2	-	-	-	-	No	-
192	HS	767206	84	-	59	66	67	78	80	88	88	-	-	9	9	10	11	10	12	-	-	-	5.5	4.5	5.3	5.2	5	4.9	4.8	3.5	No	-
193	LS	922350	-	-	61	62	64	66	68	-	-	-	-	14	13	11	10	9	-	-	-	-	5.9	6	4.9	3.8	3.3	-	-	-	No	-
194	DP	885321	88	-	63	65	75	68	72	68	67	78	-	11	10	8	9	8	5	6	-	-	5.5	5.8	3.55	4.5	4.2	3.8	3.3	3.8	No	-
195	HS	794198	-	-	63	64	68	72	66	78	88	-	-	14	15	12	11	10	9	7	-	-	4.9	5	3.6	4.5	5.2	3.9	4	-	Yes	9
196	DD	614812	-	-	67	77	65	-	-	-	-	-	-	19	18	15	-	-	-	-	-	-	8	8.1	4.5	-	-	-	-	-	Yes	2
197	GK	798520	-	-	66	82	76	79	86	78	86	-	-	17	17	14	11	9	8	9	-	-	7	7.2	4.2	4.9	5.6	4.1	3	-	Yes	8
198	A	652157	-	-	68	83	64	65	70	64	65	-	-	13	12	11	10	9	9	7	-	-	6.8	6	5.4	2.9	3.8	4	3.6	4.5	No	-

Serial no.	Name	MRD	Total days on vasopressors	Cumulative vasopressor dose	Norepinephrine (mcg/min)	Vasopressin (cumulative units)	Dobutamine in grams	Death	ICU type medical-surgical-, cardiovascular /CCU	Survival at 14 days after RRT	14 day mortality rate	14 day mortality rate after RRT	30 day mortality rate	All cause intra hospital mortality rate (last contact)	Days until death	days until discharge	duration of CRRT in hours	Days on RRT (duration of RRT)	Dailysis free days	30 day RRT dependence	RRT switch	RRT Switch to	Serum creat at discharge/last contact in survivors; mg/dl)	Total UF (ML)	Anticoagulation
133	BK	969828	10	-	480	-	-	Yes	1	No	Yes	Yes	Yes	Yes	14	-	-	6	8	-	2	-	-	8500	0
134	KI	857421	6	-	500	-	-	No	1	Yes	No	No	No	No	-	12	48	2	10	2	2	-	1.4	9000	1
135	MR	474984	3	-	640	-	-	No	2	Yes	No	No	No	No	-	22	-	4	18	2	2	-	0.7	15000	0
136	TS	922508	12	-	240	-	-	Yes	2	No	Yes	Yes	Yes	Yes	1	-	20	1	25	-	2	-	-	8000	0
137	RS	961959	6	-	390	-	-	No	1	Yes	No	No	No	No	-	20	110	4	16	2	2	-	1.2	10000	0
138	S	787665	16	-	650	-	-	Yes	1	No	No	Yes	Yes	Yes	20	-	240	10	10	-	2	-	-	15000	0
139	MK	990907	6	-	440	-	-	No	1	Yes	No	No	No	No	-	18	-	4	14	2	2	-	1.1	9000	0
140	IS	939019	7	-	600	172	-	No	1	Yes	No	No	No	No	-	14	45	2	12	2	2	-	0.8	9800	0
141	CS	871785	10	-	450	240	-	Yes	1	No	No	Yes	Yes	Yes	15	-	50	6	7	-	2	-	-	9500	1
142	M	780375	1	-	525	400	-	Yes	1	No	Yes	Yes	Yes	Yes	1	-	24	1	23	-	2	-	-	8500	0
143	MS	919231	8	-	480	-	-	Yes	1	No	Yes	Yes	Yes	Yes	11	-	89	4	7	-	2	-	-	9500	0
144	AS	616116	5	-	650	450	5.8	Yes	2	No	Yes	Yes	Yes	Yes	5	-	72	3	2	-	2	-	-	12000	0
145	MKV	970726	6	-	425	-	-	No	1	Yes	No	No	No	No	-	30	96	4	26	2	1	2	2.9	8000	0
146	SK	944065	14	-	670	340	-	Yes	1	No	No	Yes	Yes	Yes	14	-	72	3	-	-	1	2	-	8500	0
147	JS	938983	8	-	350	-	-	No	1	Yes	No	No	No	No	-	12	74	4	8	2	2	-	1.2	8900	0
148	VR	920946	12	-	600	310	9	Yes	1	No	No	Yes	Yes	Yes	22	-	170	7	14	-	2	-	-	2000	0
149	KK	873789	10	-	560	-	-	Yes	1	Yes	No	No	No	No	-	10	-	3	7	2	1	3	1.8	9000	0
150	DK	895091	15	-	600	-	5	Yes	1	No	No	Yes	Yes	Yes	19	-	60	5	14	-	1	2	-	11000	0
151	BK	792701	11	-	810	-	-	Yes	1	No	Yes	Yes	Yes	Yes	14	-	-	4	10	-	2	-	-	11000	1
152	KKA	232650	5	-	830	-	3.4	Yes	1	No	Yes	Yes	Yes	Yes	3	-	-	2	1	-	2	-	-	2000	0
153	PG	447864	5	-	290	-	-	No	2	Yes	No	No	No	No	-	18	96	4	14	2	2	-	1.7	9000	0
154	DK	426738	8	-	590	280	-	Yes	1	No	Yes	Yes	Yes	Yes	12	-	40	2	8	-	2	-	-	9000	0
155	YS	784536	8	-	600	-	-	Yes	1	No	Yes	Yes	Yes	Yes	10	-	100	5	5	-	2	-	-	9000	0
156	AK	224500	12	-	510	-	-	Yes	1	No	No	Yes	Yes	Yes	17	-	-	5	12	-	2	-	-	4500	0
157	GK	937081	11	-	590	-	-	No	1	Yes	No	No	No	No	-	21	78	6	13	2	1	2	0.6	6700	0
158	D	329217	4	-	630	150	-	No	1	Yes	No	No	No	No	-	18	-	4	14	2	2	-	1.4	5800	0
159	NK	915527	12	-	580	-	-	Yes	1	No	No	Yes	Yes	Yes	24	-	200	8	16	-	2	-	-	13000	0
160	MD	382985	4	-	560	-	-	No	1	Yes	No	No	No	No	-	17	-	3	14	2	2	-	1.3	1000	0
161	SK	937061	5	-	600	270	-	Yes	1	No	Yes	Yes	Yes	Yes	5	12	42	2	10	-	2	-	-	12500	0
162	RK	809720	4	-	390	-	-	No	1	No	No	Yes	Yes	Yes	15	-	-	5	10	-	2	-	-	9200	0
163	BD	601246	8	-	650	250	-	Yes	2	No	Yes	Yes	Yes	Yes	13	-	104	4	16	-	2	-	-	6900	0
164	RK	952186	11	-	670	-	-	Yes	1	No	Yes	Yes	Yes	Yes	12	-	-	3	9	-	2	-	-	7600	0
165	SD	416502	7	-	540	-	-	No	1	Yes	No	No	No	No	-	22	-	6	16	1	1	1	4.2	9800	0
166	VS	940029	5	-	200	-	-	No	1	Yes	No	No	No	No	-	16	68	3	13	2	1	2	1	9000	0
167	MK	957221	4	-	550	115	-	No	1	Yes	No	No	No	No	-	18	36	2	16	2	1	2	1.1	9800	1
168	GW	770976	7	-	590	460	6.9	Yes	1	No	Yes	Yes	Yes	Yes	7	-	90	4	3	-	2	-	-	7800	0
169	SS	944977	13	-	580	270	-	Yes	1	No	Yes	Yes	Yes	Yes	13	-	80	3	-	-	2	-	-	11000	0
170	AS	937682	12	-	600	-	7	Yes	1	No	No	Yes	Yes	Yes	21	-	78	3	-	-	1	1	-	9500	0
171	MK	916994	9	-	725	-	5.2	Yes	1	No	Yes	Yes	Yes	Yes	11	-	76	3	9	-	2	-	-	6800	0
172	IK	781230	10	-	640	345	-	Yes	1	No	Yes	Yes	Yes	Yes	10	-	122	5	5	-	2	-	-	9000	0
173	JB	960667	9	-	660	-	-	Yes	1	No	Yes	Yes	Yes	Yes	11	-	-	5	6	-	1	1	-	13500	1
174	RG	948864	10	-	650	-	-	Yes	1	No	Yes	Yes	Yes	Yes	10	-	-	4	6	-	2	-	-	8800	0
175	AK	970358	3	-	660	-	-	No	2	Yes	No	No	No	No	-	15	102	4	11	2	1	2	1.5	6700	0
176	VP	776796	2	-	780	200	-	Yes	1	No	Yes	Yes	Yes	Yes	2	-	36	2	4	-	2	-	-	2000	0
177	MS	913728	10	-	490	-	-	Yes	1	No	Yes	Yes	Yes	Yes	12	-	23	4	8	-	1	2	-	9000	0
178	AK	428738	9	-	750	290	6.8	Yes	1	No	Yes	Yes	Yes	Yes	10	-	72	3	7	-	2	-	-	10000	1
179	AK	942444	8	-	660	390	-	Yes	1	No	Yes	Yes	Yes	Yes	8	-	88	3	-	-	1	2	-	11000	0
180	OS	807317	8	-	550	-	-	Yes	2	No	No	Yes	Yes	Yes	14	-	-	4	10	-	1	1	-	12000	0
181	SS	948851	15	-	580	-	-	Yes	1	No	No	Yes	Yes	Yes	26	-	-	6	20	-	1	3	-	12000	0
182	GK	257292	5	-	450	190	-	No	1	Yes	No	No	No	No	-	18	68	3	15	1	1	2	3.1	11000	0
183	GS	742168	4	-	250	-	6.9	No	1	Yes	No	No	No	No	-	18	56	3	15	1	2	-	3	13000	0
184	AK	9649494	5	-	340	-	-	No	2	Yes	No	No	No	No	-	16	96	4	14	2	2	-	1.6	9000	0
185	RPS	789234	12	-	590	180	-	Yes	1	No	Yes	Yes	Yes	Yes	12	-	82	8	4	-	2	-	-	11000	1
186	RS	40348	4	-	450	-	-	No	1	Yes	No	No	No	No	-	19	-	5	14	1	2	-	3.8	9800	0
187	BK	807335	10	-	690	-	-	Yes	2	No	Yes	Yes	Yes	Yes	10	-	-	3	7	-	1	3	-	11000	0
188	MK	769582	10	-	600	350	-	Yes	1	No	Yes	Yes	Yes	Yes	10	-	140	6	4	-	1	3	-	9500	0
189	AS	77966	8	-	200	-	-	Yes	1	No	Yes	Yes	Yes	Yes	1	-	18	1	8	-	1	3	-	11000	0
190	AK	66931	6	-	300	-	-	No	2	Yes	No	No	No	No	-	20	23	1	19	2	1	2	0.8	11000	0
191	GS	587987	7	-	660	240	-	Yes	2	No	Yes	Yes	Yes	Yes	7	-	72	3	4	-	2	-	-	9800	0
192	HS	767206	8	-	290	-	-	No	1	Yes	No	Yes	No	No	11	16	72	5	11	2	1	2	2.5	4000	0
193	LS	922350	8	-	710	240	-	Yes	2	No	No	Yes	Yes	Yes	24	-	75	3	23	-	2	-	-	9500	0
194	DP	885321	14	-	640	-	3.4	Yes	1	Yes	No	No	No	No	-	21	-	6	15	2	1	3	1.2	2000	0
195	HS	794198	10	-	450	-	-	Yes	1	No	No	Yes	Yes	Yes	14	-	-	4	10	-	1	3	-	11000	0
196	DD	614812	2	-	440	290	-	Yes	1	No	Yes	Yes	Yes	Yes	2	-	-	1	5	-	2	-	-	6500	0
197	GK	798520	15	-	560	-	2.3	Yes	1	No	No	Yes	Yes	Yes	17	-	-	4	13	-	1	1	-	7600	0
198	A	652157	6	-	500	-	-	No	1	No	No	Yes	Yes	Yes	16	-	-	4	13	-	2	-	-	11000	0

Serial no.	Name	MRD	Age	Gender	Group	Etiology of Aki	Category	Baseline Hb (g/dl)	Premorbid creatinine(mg/dl)	Hco3 baseline	Need for vasopressor	SBP	DBP	Reason for AKI	DM	HTN	COPD	CAD	CKD	CHF	Neurology/post stroke	Malignancy	Pancreatitis	Indication of dialysis	SOFA score_	SOFA score day 0	SOFA score day 1	SOFA score day 3	SOFA score day 5	SOFA score day 7	SOFA score day 10	SOFA score day 14	SOFA score day 30	s. Creat	s.Creat_day 0	s.Creat_day 1
199	HM	945467	54	1	2	11	1	10	1.5	10	Yes	90	65	2	Present	Present	Absent	Present	Present	Absent	Absent	Absent	Absent	2	-	15	16	14	13	-	12	-	-	-	8.8	9
200	SR	957722	56	1	1	3	1	8.5	-	19	Yes	96	61	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	11	11	12	10	9	8	7	4	-	11	11
201	PK	779775	65	1	1	11	1	9.6	-	14	Yes	90	64	2	Absent	Absent	Present	Present	Absent	Present	Absent	Absent	Absent	2	-	15	15	14	15	10	8	-	-	-	8.4	9
202	RS	810395	70	1	2	3	1	11	2.5	13	Yes	82	64	3	Present	Absent	Absent	Absent	Present	Absent	Absent	Absent	Absent	1	-	15	14	13	13	11	11	11	-	-	9	8.4
203	RS	925732	56	1	1	6	2	9.2	-	19	Yes	90	60	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	12	12	14	11	10	9	7	5	-	10	11
204	JS	873705	55	1	2	11	1	10.5	3	7	Yes	90	60	2	Present	Present	Absent	Present	Present	Present	Absent	Absent	Absent	4	-	16	15	14	10	-	8	4	3	-	6.8	5.5
205	AS	678831	61	1	3	2	1	10.6	-	12	Yes	90	56	1	Absent	Present	Present	Present	Present	Absent	Absent	Absent	Absent	1	-	12	15	14	16	15	-	-	-	-	9	9.2
206	SD	808067	70	2	2	9	1	9.6	2.1	14	Yes	84	60	2	Present	Present	Present	Absent	Present	Absent	Absent	Absent	Absent	2	-	16	16	15	14	10	9	-	-	-	9	10
207	RL	768128	76	2	1	1	1	11	3	11	Yes	92	62	1	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	3	-	15	15	15	15	11	9	9	11	-	9.4	10
208	S	875943	65	1	2	1	1	9	-	18	Yes	88	50	1	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	Absent	3	-	10	10	10	9	8	8	6	5	-	9.1	8.5
209	V	937616	76	2	3	11	1	10	-	12	Yes	86	66	2	Absent	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	2	-	11	18	17	16	16	-	-	-	-	9	9.9
210	RD	944591	56	1	3	11	1	7.3	-	13	Yes	86	64	2	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	Present	3	-	3	16	-	-	-	-	-	-	-	9	9.9
211	AK	896375	54	1	2	6	1	10	-	9	Yes	88	64	1	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Present	4	-	11	11	9	9	4	5	4	4	-	11.6	7.8
212	V	668172	76	2	2	6	1	10.4	-	13	Yes	90	60	1	Absent	Present	Absent	Absent	Absent	Absent	Present	Absent	Absent	1	-	15	15	14	13	12	10	-	-	-	8.5	9
213	RK	262311	60	1	2	8	1	10	-	10	Yes	100	64	1	Present	Present	Absent	Present	Absent	Absent	Absent	Absent	Absent	2	-	14	13	12	11	8	9	7	5	-	8.1	6.6
214	A	906507	51	1	2	2	1	12	2	8	Yes	90	62	1	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	3	-	11	10	11	11	9	6	4	4	-	9.2	7.5
215	DS	891980	51	1	2	11	1	9	-	13	Yes	88	68	2	Present	Absent	Present	Present	Absent	Absent	Absent	Absent	Present	1	-	13	13	12	11	-	9	9	6	-	11	8
216	PS	934046	55	1	3	7	1	10.2	-	12	Yes	90	60	1	Absent	Absent	Absent	Absent	Absent	Present	Absent	Absent	Absent	1	-	19	19	16	11	9	7	8	6	-	12	13.4
217	K	470330	56	1	2	10	1	11.2	-	10	Yes	100	70	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	11	11	9	10	8	9	7	3	-	7.3	9.5
218	GK	782276	67	1	2	7	1	8.6	-	15	Yes	84	58	1	Absent	Absent	Absent	Absent	Present	Absent	Absent	Present	Present	4	-	14	15	13	13	12	10	9	-	-	6.6	7
219	VM	334615	65	1	1	6	1	11	-	14	Yes	88	56	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	14	14	13	10	9	8	6	4	-	11.3	11
220	MK	769582	76	1	1	1	1	12	-	14	Yes	90	60	1	Present	Present	Absent	Present	Present	Present	Absent	Absent	Absent	2	-	15	15	16	16	15	15	-	-	-	11.2	11
221	BS	910962	58	2	2	6	1	10.5	-	12	Yes	88	63	1	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	2	-	13	12	11	10	5	6	5	3	-	8.8	10.9
222	SD	351356	58	2	3	1	1	7.8	3.2	10	Yes	88	62	1	Absent	Absent	Absent	Absent	Present	Absent	Absent	Absent	Absent	1	-	13	18	14	-	-	-	-	-	-	7.9	8.3
223	SK	804627	66	2	2	8	1	9.3	-	16	Yes	84	60	1	Present	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	16	16	15	14	12	11	8	-	-	7	7.5
224	SS	465052	54	1	2	5	1	9.5	-	19	Yes	100	70	1	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	Absent	3	-	9	9	9	11	10	4	5	3	-	6.8	8.8
225	TL	875357	54	2	2	1	1	111	-	12	Yes	90	56	1	Present	Present	Absent	Present	Absent	Present	Absent	Absent	Absent	2	-	14	14	13	11	-	9	6	4	-	9.2	6.4
226	A	804852	45	1	2	11	1	12	-	10	Yes	98	60	2	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	9	10	9	10	8	5	5	4	-	9.9	7.9
227	RS	891631	54	1	2	1	1	10.2	-	12	Yes	90	60	1	Absent	Present	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	12	12	11	9	9	10	6	5	-	13.4	9.9
228	KKS	781116	67	1	1	11	1	10.3	-	12	Yes	90	60	2	Present	Present	Absent	Present	Absent	Present	Absent	Absent	Present	4	-	16	16	15	16	16	-	-	-	-	8.8	8.8
229	VM	977714	67	2	1	11	1	12	-	8	Yes	90	62	2	Present	Present	Absent	Present	Absent	Present	Present	Absent	Absent	2	-	12	12	10	9	8	4	4	4	-	9	9
230	KS	937101	46	1	1	2	1	11.2	-	10	Yes	100	70	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	3	-	12	12	14	10	8	9	7	4	-	8.3	8
231	PS	805249	45	2	2	10	1	10.7	1.9	12	Yes	86	62	1	Present	Present	Present	Absent	Present	Absent	Absent	Absent	Absent	1	-	15	14	14	12	12	9	-	-	-	7	7.1
232	SG	815207	70	1	3	6	1	9.6	3	11	Yes	92	62	1	Present	Present	Absent	Absent	Present	Present	Present	Absent	Absent	1	-	12	17	16	-	-	-	-	-	-	9	9.4
233	S	445212	48	2	2	1	1	9.6	-	15	Yes	88	63	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	9	9	9	9	11	4	5	3	-	12.1	9.5
234	BS	768596	72	1	1	7	1	10.5	3	7	Yes	90	60	1	Present	Present	Absent	Present	Present	Present	Absent	Absent	Absent	4	-	18	21	17	18	-	-	-	-	-	6.8	7
235	DR	913007	69	1	2	6	1	9.4	-	12	Yes	84	64	1	Absent	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	3	-	14	14	13	13	14	12	-	-	-	11.2	12
236	SK	946234	54	2	1	3	1	11	-	8	Yes	106	88	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	2	-	12	12	11	9	9	9	7	3	-	6.5	6.5
237	RB	513592	86	1	1	3	1	12	-	15	Yes	88	62	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	1	-	17	16	15	16	17	16	-	-	-	9.7	9
238	HL	336403	65	2	2	7	1	11	-	9	Yes	98	60	3	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	4	-	13	12	10	12	9	6	4	3	-	10.5	7
239	NS	921881	68	2	1	8	1	11	-	16	Yes	84	60	1	Present	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	1	-	16	16	15	14	12	13	-	-	-	6.4	6
240	TK	881091	58	1	2	6	1	9	-	15	Yes	96	66	1	Present	Present	Present	Present	Absent	Absent	Absent	Absent	Absent	3	-	9	9	10	11	8	4	5	4	-	10	8.6
241	R	816534	69	1	2	2	2	8	-	9	Yes	98	60	3	Absent	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent	3	-	10	12	11	11	9	8	7	6	-	7	6.5
242	RC	974519	76	2	1	9	1	11	-	7	Yes	96	61	1	Present	Present	Absent	Present	Absent	Absent	Absent	Absent	Present	1	-	13	16	12	11	9	7	6	5	-	7	8
243	JK	943441	58	1	3	9	1	10.4	-	13	Yes	90	60	1	Present	Present	Absent	Present	Absent	Absent	Absent	Absent	Absent	4	-	11	16	16	-	-	-	-	-	-	8	8.8
244	AK	713962	56	2	1	3	1	8	2.5	10	Yes	88	48	1	Present	Present	Absent	Absent	Present	Absent	Absent	Absent	Present	1	-	15	19	16	16	17	14	-	-	-	8.4	8.4
245	SS	945102	76	1	3	3	1	9.6	4	13	Yes	88	58	1	Absent	Absent	Absent	Absent	Present	Absent	Absent	Absent	Absent	2	-	15	16	15	14	16	-	-	-	-	7.8	7.4

Serial no.	Name	MRD	s.Creat_day 3	s.Creat_day 5	s.Creat_day 7	s.Creat_day 10	s.Creat_day 14	s.Creat_day 30	s. Urea	s.Urea_day 0	s.Urea_day 1	s.Urea_day 3	s.Urea_day 5	URR	s.Urea_day 7	s.Urea_day 10	s.Urea_day 14	s.Urea_day 30	UOP (24hrs)	UOP (24hrs) day 0	UOP (24hrs) day 1	UOP (24hrs) day 3	UOP(24hrs)_day 5	UOP(24hrs)_day 7	UOP(24hrs)_day 10	UOP(24hrs)_day 14	UOP(24hrs)_day 30	Ph	Ph_day 0	Ph_day 1	Ph_day 3	Ph_day 5
199	HM	945467	6	5.2	8.2	4	-	-	-	187	187	72	113	61.5	98	87	-	-	-	600	600	350	1340	1400	1425	-	-	-	7.13	7.11	7.2	7.37
200	SR	957722	10.8	9.4	7.4	4.5	2.8	1.2	-	175	175	65	93	62.9	73	55	50	48	-	800	900	1200	1500	1950	2200	2600	3000	-	7.1	7.1	7.3	7.32
201	PK	779775	7.9	5.3	5	4.4	-	-	-	197	200	72	116	64.0	89	86	-	-	-	400	400	450	600	700	950	-	-	-	7.11	7.2	7.25	7.32
202	RS	810395	5.8	5.7	3.4	4	4	-	-	176	180	69	94	61.7	56	78	-	-	-	600	400	800	200	1300	1500	-	-	-	7.11	7.11	7.28	7.13
203	RS	925732	8.4	6.7	4.7	3.1	1.9	1.6	-	197	200	83	92	58.5	98	65	49	42	-	600	700	800	1300	1700	1900	1950	2000	-	7.11	7.12	7.25	7.29
204	JS	873705	5.9	3.5	4.4	4.4	2.1	1.3	-	200	195	92	104	52.8	80	88	98	66	-	200	400	150	200	1700	1550	1500	1600	-	7.11	7.11	7.25	7.34
205	AS	678831	8.6	7.5	6.3	-	-	-	-	265	270	117	140	56.7	138	-	-	-	-	300	300	200	250	150	-	-	-	-	7.11	7.26	7.29	7.32
206	SD	808067	7.8	5.4	2.3	3.4	4	-	-	201	201	110	136	45.3	65	65	78	-	-	300	400	1450	1500	1420	1300	700	-	-	7.07	7.17	7.21	7.34
207	RL	768128	8.1	7.6	4.2	3.3	3.1	3.8	3.4	205	209	112	100	46.4	98	96	98	88	-	300	300	425	1350	1400	700	800	350	-	7.12	7.14	7.16	7.31
208	S	875943	6.5	5.4	8.5	3.5	4.8	3.9	-	201	166	76	90	54.2	55	65	55	40	-	900	1200	1600	1750	2200	2600	2800	3200	-	7.2	7.23	7.77	7.29
209	V	937616	8.8	7.2	6.4	-	-	-	-	194	198	79	125	60.1	123	-	-	-	-	350	400	250	600	800	-	-	-	-	7.1	7.1	7.12	7.18
210	RD	944591	-	-	-	-	-	-	-	214	220	101	125	54.1	-	-	-	-	-	350	700	-	-	-	-	-	-	-	7.23	7.24	-	-
211	AK	896375	8.5	5.5	3.4	5.5	4.1	5	-	300	218	90	124	58.7	60	40	46	42	-	600	500	600	500	950	1750	600	2000	-	7.11	7.12	0.21	7.28
212	V	668172	7.6	8.7	5.4	4.4	-	-	-	187	188	92	92	51.1	68	88	-	-	-	400	300	340	375	600	800	-	-	-	7.12	7.13	7.26	7.21
213	RK	262311	6.5	4.6	4.8	3.2	1.5	0.8	-	206	192	93	124	51.6	125	56	65	44	-	1100	1200	1600	1850	2550	2800	2200	2850	-	7.21	7.23	7.21	7.22
214	A	906507	6.8	5.4	6	8	5.6	4.5	-	201	199	92	110	53.8	120	46	44	85	-	650	650	850	650	800	1200	1050	1550	-	7.11	7.12	7.22	7.34
215	DS	891980	9.8	10.4	6.6	3	1	1	-	198	198	78	71	60.6	106	54	25	32	-	500	400	270	1290	1390	1320	1000	1200	-	7.11	7.11	7.22	7.26
216	PS	934046	10.8	8.6	7.4	6.3	3.6	2	-	140	140	56	93	60.0	80	69	65	42	-	800	700	800	800	1000	800	1200	1200	-	7.14	7.21	7.29	7.8
217	K	470330	5.6	6.5	4.5	3.5	2.8	1.3	-	200	195	105	91	46.2	120	110	66	44	-	600	500	750	900	1200	1450	1980	2000	-	7.14	7.16	7.16	7.29
218	GK	782276	4.6	7.2	4.6	4	4	-	-	200	210	101	112	51.9	65	88	-	-	-	400	500	1400	1350	1450	1450	1400	900	-	7.12	7.16	7.33	7.28
219	VM	334615	8.5	5.5	4.5	3.2	2.9	1.2	-	239	240	109	150	54.6	125	80	75	45	-	1000	1000	1200	1400	1450	1700	1850	1900	-	7.11	7.12	7.28	7.32
220	MK	769582	10.4	8.6	7.4	6.2	-	-	-	275	274	127	178	53.6	150	107	-	-	-	450	450	400	1420	1200	850	-	-	-	7.1	7.1	7.2	7.29
221	BS	910962	7.1	6	6.6	4.2	4	3	-	311	301	120	120	60.1	98	44	56	44	-	800	700	700	600	1050	800	1000	1950	-	7.19	7.21	7.28	7.38
222	SD	351356	-	-	-	-	-	-	-	200	210	112	125	46.7	-	-	-	-	-	200	250	-	-	-	-	-	-	-	7.1	7.12	-	-
223	SK	804627	4.9	4.1	7.6	8.6	-	-	-	167	167	80	71	52.1	76	-	-	-	-	450	350	1400	1450	1250	1300	-	-	-	7.21	7.22	7.27	7.35
224	SS	465052	3.5	5.4	3.4	3.2	2.1	1.2	-	140	150	66	65	56.0	66	58	30	58	-	1000	1200	1050	1600	2250	2500	2800	3100	-	7.13	7.14	7.39	7.29
225	TL	875357	8.6	7.5	6.3	2.8	1.9	1.3	-	178	178	79	94	55.6	123	56	65	45	-	550	600	250	200	390	600	500	700	-	7.11	7.16	7.29	7.42
226	A	804852	8.8	6.1	7.2	3.1	2.2	1.1	-	240	217	97	102	55.3	90	65	58	45	-	700	800	1850	1250	2100	2500	2800	3000	-	7.16	7.18	7.2	7.28
227	RS	891631	10.8	6.4	7.4	6.3	3.6	4.8	-	190	202	115	155	43.1	56	66	66	34	-	400	500	200	850	475	600	850	1200	-	7.24	7.21	7.19	7.24
228	KKS	781116	7.3	6.4	5.9	-	-	-	-	195	195	89	96	54.4	87	-	-	-	-	275	275	1280	1300	1350	-	-	-	-	7.1	7	7.19	7.25
229	VM	977714	6	5.7	1.9	1.2	1.4	0.9	-	198	198	85	87	57.1	87	66	44	38	-	800	900	1200	1500	2000	2300	3000	3600	-	7.1	7.11	7.34	7.42
230	KS	937101	7.6	6.5	4.5	3.5	2.8	1.3	-	170	170	72	99	57.6	98	64	44	46	-	600	600	750	900	1200	1450	1980	2200	-	7.12	7.16	7.26	7.29
231	PS	805249	5.2	5.5	6.4	4.5	4	-	-	108	108	52	134	51.9	123	45	-	-	-	500	300	250	500	1400	1400	-	-	-	7.09	7.09	7.21	7.37
232	SG	815207	8.1	-	-	-	-	-	-	205	205	115	136	43.9	-	-	-	-	-	400	800	350	-	-	-	-	-	-	7.12	7.14	7.16	-
233	S	445212	10.6	5.8	7.6	5.4	3.5	1.2	-	129	111	62	62	44.1	85	75	70	76	-	800	800	1200	1050	1550	1700	2200	2800	-	7.14	7.15	7.34	7.44
234	BS	768596	5.9	4.8	-	-	-	-	-	142	144	76	73	47.2	-	-	-	-	-	200	200	550	750	-	-	-	-	-	7	7.01	7.25	7.34
235	DR	913007	9	7.4	4.5	5.9	-	-	-	201	210	121	134	42.4	101	98	-	-	-	500	400	400	415	290	750	-	-	-	7.1	7.11	7.22	7.35
236	SK	946234	5.5	4.2	3.2	2.5	1.8	1	-	162	162	89	90	45.1	95	85	65	55	-	650	700	700	800	1050	1500	2200	2600	-	7.15	7.19	7.25	7.29
237	RB	513592	8.6	7.3	5.5	4.5	-	-	-	215	215	121	145	43.7	126	110	-	-	-	450	450	400	450	600	500	-	-	-	7.1	7.19	7.26	7.29
238	HL	336403	11.5	4.4	6.2	2.8	1.9	1.3	-	220	210	117	134	44.3	68	96	79	44	-	1000	950	1000	1200	1600	1800	1850	1920	-	7.19	7.19	7.39	7.35
239	NS	921881	4.9	4.3	4.4	4.4	-	-	-	164	164	76	80	53.7	102	78	-	-	-	350	350	400	1450	1450	600	-	-	-	7.21	7.22	7.27	7.45
240	TK	881091	8.6	6.5	4.9	3.2	4.6	1.1	-	200	117	46	70	60.7	85	44	48	45	-	700	800	1500	1800	2500	2650	2750	2900	-	7.08	7.18	7.22	7.37
241	R	816534	6.5	3.5	3.2	5.8	1.9	1.3	-	167	167	60	93	64.1	67	54	67	54	-	950	950	1000	1200	1600	1800	1850	1900	-	7.09	7.09	7.19	7.35
242	RC	974519	5.2	4.8	3.5	3.1	1.5	0.8	-	201	230	129	90	43.9	88	39	75	40	-	700	700	960	1060	1560	1950	2100	2500	-	7.1	7.1	7.25	7.35
243	JK	943441	7.6	-	-	-	-	-	-	217	217	115	135	47.0	-	-	-	-	-	350	650	600	-	-	-	-	-	-	7.12	7.13	7.16	-
244	AK	713962	7.4	7.2	6.9	5.8	-	-	-	220	220	101	145	54.1	97	75	-	-	-	600	700	600	850	550	850	-	-	-	7.1	7.1	7.19	7.26
245	SS	945102	6.9	5.2	4.1	-	-	-	-	175	180	76	113	57.8	89	-	-	-	-	200	700	750	1475	1600	-	-	-	-	7.18	7.29	7.32	7.33

Serial no.	Name	MRD	Ph_day 7	Ph_day 10	Ph_day 14	Ph_day 30	Lactate	Lactate_ day 0	Lactate_d ay 1	Lactate_d ay 3	Lactate_d ay 5	Lactate_d ay 7	Lactate_d ay 10	Lactate_d ay 14	Lactate_d ay 30	S HCO3	S HCO3_day 0	S HCO3_da y 1	S HCO3_da y 3	S HCO3_da y 5	S HCO3_da y 7	S HCO3_da y 10	S HCO3_da y 14	S HCO3_da y 30	HR	HR_day 0	HR_day 1	HR_day 3	HR_day 5	HR_day 7	HR_day 10	HR_day 14
199	HM	945467	7.29	7.21	-	-	-	9	10	4.2	2.3	3	1.8	-	-	-	16	18.3	16.9	20.2	16.5	9.4	-	-	-	130	122	118	98	100	102	-
200	SR	957722	7.35	7.33	7.34	7.38	-	3.3	3	2.1	1.9	1.3	1.6	1.1	0.8	-	9.8	9.8	17	19.6	18.5	21.1	19.4	21	-	120	116	104	108	100	98	96
201	PK	779775	7.23	7.25	-	-	-	4	4.8	5.3	3.5	3.4	3.2	-	-	-	9	9.8	11	17.8	10	8	-	-	-	134	120	124	98	-	-	-
202	RS	810395	7.34	7.44	7.34	-	-	11.7	12	4.6	2.9	1.8	2	2.5	1.2	-	11.7	11.7	13.5	14.3	12.2	14	18	-	-	126	116	110	120	108	96	90
203	RS	925732	7.33	7.35	7.36	7.38	-	5	5.4	6.1	3.9	2.6	1.8	1	0.7	-	10	13	19.4	21.5	21.3	19.5	22	21.5	-	116	108	108	112	102	96	98
204	JS	873705	7.36	7.36	7.34	7.35	-	6.2	6.2	2.9	2.5	2	1.9	1.5	0.8	-	9	11	15.4	17.9	22.5	19	21	21	-	120	112	112	116	98	96	98
205	AS	678831	7.33	-	-	-	-	11	7.9	7	8.2	6.7	-	-	-	-	11	11.5	9.1	10.4	8.2	-	-	-	-	120	126	124	126	122	-	-
206	SD	808067	7.27	7.21	7.4	-	-	5.9	5	2.3	3.4	2	1.5	1.6	-	-	14	14.9	18.7	15.8	10.5	15	13	-	-	126	114	112	122	112	90	100
207	RL	768128	7.27	7.29	7.31	7.4	7.42	4	4.8	5.3	1.8	1.8	1.9	3	1.9	2	9	9.8	14.6	11.9	8	8	9	9	8	124	128	128	103	98	98	114
208	S	875943	7.26	7.42	7.37	7.43	-	5.6	6	2.5	1	0.9	1.6	0.6	0.9	-	10	8.3	16.8	15.9	19	19.8	17	20	-	98	90	94	101	100	98	96
209	V	937616	7.27	-	-	-	-	5.5	3.5	4	4	5	-	-	-	-	9	9.1	14.3	12.2	9.7	-	-	-	-	134	124	124	120	100	-	-
210	RD	944591	-	-	-	-	-	9.6	6.7	4.8	-	-	-	-	-	-	14	9	-	-	-	-	-	-	-	134	124	-	-	-	-	-
211	AK	896375	7.34	7.28	7.33	7.27	-	6	6	4	3.4	1.8	1.9	1.5	1.3	-	15.5	13.5	20	23.2	22	19	21	25	-	99	105	92	90	92	92	86
212	V	668172	7.35	-	-	-	-	6	6.6	2	1.9	2	-	-	-	-	9.7	10	13.5	18.3	19.2	16.4	-	-	-	123	118	112	124	94	79	-
213	RK	262311	7.3	7.35	7.35	7.3	-	7	8	2	1.3	2	1.3	1.2	0.4	-	11	10	13	18	22	14	16.4	21	-	102	98	94	104	98	96	72
214	A	906507	7.35	7.44	7.34	7.3	-	4	5	5.5	3	1	1	1	1	-	9	10	14	16	11	22	17	21	-	100	106	90	100	90	90	100
215	DS	891980	7.35	7.29	7.47	7.39	-	6	5.2	3.4	4.1	3.2	4.4	1.1	1	-	9	11	17	21.9	19	22.2	21	23	-	128	128	124	130	111	102	99
216	PS	934046	7.32	7.35	7.25	-	-	13.7	9.6	4.4	3.9	2.4	1.8	1.5	1	-	8	11	17	21	20	23	21.7	19	-	116	106	104	110	106	98	92
217	K	470330	7.42	7.35	7.32	7.42	-	9	8.4	3	1.3	1	0.9	1	1.2	-	8	9	16.9	16	21	17	16.2	17.9	-	105	100	96	106	102	96	94
218	GK	782276	7.44	7.45	7.4	-	-	7	7.2	3.1	1.8	2	1.8	1.6	-	-	9	9.3	18.2	20.2	15.8	15	13	-	-	145	130	122	112	101	100	98
219	VM	334615	7.35	7.36	7.37	7.45	-	8	8.6	3.5	3.1	2.4	2	1.6	1	-	9	9.1	19.4	21.7	18.8	23	17.3	23.6	-	110	96	96	102	104	102	100
220	MK	769582	7.32	7.29	-	-	-	4	4.2	4.8	4	2.8	3	-	-	-	8	8.6	12.3	12.3	10.4	11.2	-	-	-	130	118	118	128	112	102	-
221	BS	910962	7.36	7.32	7.32	7.42	-	8	9.4	4	4	2	3	1	1	-	11	11	22	17	22	16	21	22	-	110	104	86	96	102	100	92
222	SD	351356	-	-	-	-	-	14.4	7.9	4.3	-	-	-	-	-	-	8	8.2	-	-	-	-	-	-	-	128	118	-	-	-	-	-
223	SK	804627	7.15	7.29	-	-	-	5.1	5	4.1	3.7	2	3.1	-	-	-	8.2	9	10.2	16.5	14	17	-	-	-	124	114	122	126	98	100	-
224	SS	465052	7.36	7.35	7.39	7.29	-	7	6	3	3	2	1.4	1.1	1	-	9	10	13	17	20.1	22	21.5	20	-	108	98	98	102	96	92	90
225	TL	875357	7.33	7.34	7.32	7.24	-	9.6	9.6	7.9	3.2	5.6	1	1.5	0.7	-	14	16	21.2	23	23.2	18	20	25	-	120	122	120	126	118	108	98
226	A	804852	7.29	7.27	7.32	7.24	-	9	7.9	1.5	1	2	1	1	1	-	13	11	15	20.2	21	23	17	19.9	-	98	98	104	110	102	94	90
227	RS	891631	7.42	7.45	7.31	7.34	-	4	3.3	2	1.9	1	1.6	1	1.1	-	9	11.5	15	18.6	13.9	15.9	18	19.9	-	110	110	104	114	106	102	92
228	KKS	781116	7.34	-	-	-	-	8.4	8	3.2	3.1	2	-	-	-	-	9	10	9	12.2	14	-	-	-	-	125	120	120	104	98	-	-
229	VM	977714	7.34	7.26	7.34	7.44	-	6.5	6	2.6	2	1.2	1.2	1	1	-	10	11	21.1	18	19.5	17.7	15.9	22.2	-	102	102	96	110	90	86	80
230	KS	937101	7.32	7.35	7.39	7.32	-	4	4.8	2.3	2	2.6	1.9	1.7	1.3	-	9	9	18.8	2.05	20.2	18.6	20.2	22	-	106	96	96	106	98	96	94
231	PS	805249	7.48	7.44	-	-	-	11	9	7.9	17	14	14	16	-	-	10	11.1	15.4	14	13	16	-	-	-	130	116	114	100	98	98	-
232	SG	815207	-	-	-	-	-	8	7.8	4	-	-	-	-	-	-	12.5	13	11.5	-	-	-	-	-	-	120	128	128	-	-	-	-
233	S	445212	7.45	7.49	7.35	7.35	-	4	5	5	1.5	2	1.3	1.2	0.6	-	8	10.8	18	17.9	17.5	21	22	20	-	104	90	90	102	92	100	94
234	BS	768596	-	-	-	-	-	8.7	8	3.5	4.8	-	-	-	-	-	4.5	4.5	15	14.8	-	-	-	-	-	120	116	112	122	-	-	-
235	DR	913007	7.45	7.26	-	-	-	6.9	6	2.4	1.4	1.7	1.5	-	-	-	7	7.7	14.9	19.4	20.5	19.4	-	-	-	100	126	102	120	112	112	-
236	SK	946234	7.32	7.34	7.33	7.34	-	3.6	3	2.8	1.9	2.4	1.5	1	0.8	-	9	11.5	13.6	17.9	18.5	20.9	20.5	17.5	-	109	96	96	102	98	94	88
237	RB	513592	7.32	7.33	-	-	-	3.3	3	5.1	2.4	1	1.9	-	-	-	12	12	18.3	16.6	14.9	15.8	-	-	-	120	118	112	96	90	98	-
238	HL	336403	7.36	7.44	7.37	7.41	-	7	8.6	4	1.9	3	1.9	1.7	1.2	-	11	11	17	16	19	18	19.8	18	-	109	94	94	98	102	90	86
239	NS	921881	7.34	7.33	-	-	-	4.2	4	4.8	3.7	4	4.3	-	-	-	8	9	18.2	10.5	14	9	-	-	-	140	130	122	126	100	110	-
240	TK	881091	7.23	7.36	7.33	7.32	-	3	4.2	1	1.7	2	2	0.8	0.9	-	7	9	16.2	20.5	19.4	21	19	19	-	114	108	104	110	108	114	102
241	R	816534	7.36	7.44	7.34	7.31	-	7	8	2.9	2	2	1.3	1.5	0.8	-	11.9	12	14.9	18.7	22.2	21.1	19.4	18.6	-	140	127	124	96	98	86	80
242	RC	974519	7.37	7.35	7.39	7.32	-	9	9.6	3.9	2.2	2.6	1.7	0.9	0.5	-	9	9	18.6	22	21	16.9	17	16	-	114	104	102	112	110	104	106
243	JK	943441	-	-	-	-	-	8.6	6.8	5.6	-	-	-	-	-	-	10	7	9.1	-	-	-	-	-	-	120	128	112	-	-	-	-
244	AK	713962	7.31	7.24	-	-	-	7	7.7	8.4	5.3	2.4	3.4	-	-	-	10	11.2	13.4	14.5	15.5	11	-	-	-	128	120	124	101	98	111	-
245	SS	945102	7.3	-	-	-	-	7	8.1	6.7	4	3.2	-	-	-	-	14	12	9.7	8.6	10.7	-	-	-	-	109	122	116	102	111	-	-

Serial no.	Name	MRD	HR_day 30	MAP	MAP_day 0	MAP_day 1	MAP_day 3	MAP_day 5	MAP_day 7	MAP_day 10	MAP_day 14	MAP_day 30	CVP	CVP_day 0	CVP_day 1	CVP_day 3	CVP_day 5	CVP_day 7	CVP_day 10	CVP_day 14	CVP_day 30	s. K	S.K_day 0	S.K_day 1	S.K_day 3	S.K_day 5	S.K_day 7	S.K_day 10	S.K_day 14	S.K_day 30	Need for mechanical ventilation.	Total days on mechanical ventilation
199	HM	945467	-	-	68	69	70	69	61	62	-	-	-	13	13	10	9	8	7	-	-	-	6.3	6.1	4.5	4.9	4.3	5.1	-	-	No	-
200	SR	957722	92	-	67	72	67	70	70	70	71	78	-	11	11	10	9	8	7	7	-	-	6	6.2	4.2	4.2	3.9	4.2	4.4	3.6	No	-
201	PK	779775	-	-	63	63	65	64	62	61	-	-	-	15	14	13	12	11	9	-	-	-	5	5.7	4.5	4	3.9	3.7	-	-	Yes	9
202	RS	810395	-	-	66	74	78	66	68	62	78	-	-	15	15	13	12	11	8	7	-	-	6	5.6	5.9	4.8	5.3	4.1	3	-	No	-
203	RS	925732	100	-	71	71	75	67	70	66	65	79	-	10	10	9	8	7	7	8	-	-	6.6	6.8	4.8	4	3.6	4.2	4.8	3.2	No	-
204	JS	873705	100	-	69	65	63	68	73	74	76	80	-	9	8	10	12	6	7	6	-	-	6	7	5	4	4.5	3.5	4.4	3.6	No	-
205	AS	678831	-	-	60	62	64	76	78	-	-	-	-	13	13	12	10	9	-	-	-	-	6.2	6	5.9	4.2	3.9	-	-	-	Yes	7
206	SD	808067	-	-	62	67	71	63	62	68	88	-	-	16	16	12	10	11	9	8	-	-	6.5	7	5.1	5.8	5.4	4	3	-	No	-
207	RL	768128	110	89	60	60	61	63	78	65	60	64	66	13	13	11	10	9	8	8	7	-	6	5	5	4.5	3.7	3.3	4.3	4.4	Yes	10
208	S	875943	98	-	74	74	67	60	64	71	79	85	-	13	12	11	10	11	9	8	-	-	6	6.2	4.1	3.9	3.6	3.1	3.2	3.9	Yes	7
209	V	937616	-	-	60	59	60	62	68	-	-	-	-	15	14	11	9	7	-	-	-	-	6	5.7	4.9	4.5	3.5	-	-	-	Yes	8
210	RD	944591	-	-	62	62	-	-	-	-	-	-	-	15	15	-	-	-	-	-	-	-	6	5.8	-	-	-	-	-	-	No	-
211	AK	896375	100	-	69	69	65	74	62	72	78	68	-	15	15	14	12	9	8	9	-	-	4.2	5	3.5	4	4.4	4.9	4	3.6	No	-
212	V	668172	-	-	68	70	64	77	64	61	-	-	-	12	12	8	7	6	5	-	-	-	6	6.1	4.5	3.9	3.9	3.9	-	-	Yes	7
213	RK	262311	93	-	70	72	68	68	64	68	72	77	-	13	12	11	9	10	8	8	-	-	6	6.3	4	4	3.9	4.1	4.7	4.9	Yes	7
214	A	906507	102	-	59	68	68	65	72	67	79	86	-	10	10	8	10	7	10	7	-	-	5.9	5.6	4.2	4.4	4.1	4.9	4	4.3	Yes	7
215	DS	891980	90	-	61	60	71	66	61	60	78	82	-	13	13	11	8	8	6	5	-	-	6.7	6	4.5	4.3	4.9	3.9	4.3	4	No	-
216	PS	934046	88	-	66	76	64	67	65	67	68	76	-	12	12	11	6	10	7	8	-	-	6.3	6.2	4.6	4.6	3.8	3.6	3.3	3.2	Yes	8
217	K	470330	90	-	68	67	68	82	66	84	88	80	-	13	12	11	10	9	8	6	-	-	6	6.1	4.3	3.9	3.4	4	3	4	Yes	6
218	GK	782276	-	-	66	67	69	90	67	88	90	-	-	14	13	10	10	8	7	8	-	-	5	5.9	5.5	4.6	4.6	3.6	4	-	No	-
219	VM	334615	96	-	64	78	64	63	66	62	61	76	-	11	11	10	9	8	7	6	-	-	6	6.3	5.5	4.9	4.5	4.6	4.5	4.3	Yes	5
220	MK	769582	-	-	66	62	62	63	64	62	-	-	-	13	12	10	11	9	7	-	-	-	6	5.8	3.55	4.5	4.2	3.8	-	-	Yes	8
221	BS	910962	88	-	73	62	73	78	82	80	76	76	-	13	12	14	16	14	12	10	-	-	7	6.6	4.8	3.1	4.1	3.9	3.7	3.4	Yes	8
222	SD	351356	-	-	62	62	-	-	-	-	-	-	-	15	16	-	-	-	-	-	-	-	6	6.3	-	-	-	-	-	-	No	-
223	SK	804627	-	-	65	68	62	76	78	90	-	-	-	15	14	10	9	8	9	-	-	-	6	6.2	3.5	3.7	4	4	-	-	No	-
224	SS	465052	88	-	66	73	71	72	72	75	79	78	-	10	10	11	12	8	7	6	-	-	6.7	7	5.5	4.2	4.2	5.5	5.1	5.2	No	-
225	TL	875357	90	-	60	61	72	71	68	64	78	80	-	16	15	14	12	11	8	9	-	-	6.1	6.8	3	4.2	3.9	5	4.5	3.9	No	-
226	A	804852	92	-	63	73	60	72	65	68	70	81	-	10	10	8	7	6	7	6	-	-	6.3	6	4.3	3.4	4.3	2.9	5	3.4	Yes	6
227	RS	891631	94	-	73	76	65	64	70	72	77	75	-	13	12	11	8	10	9	10	-	-	5.7	6	4.3	3.9	3.2	3.1	3.8	4.1	Yes	9
228	KKS	781116	-	-	62	61	63	62	60	-	-	-	-	16	15	13	12	10	-	-	-	-	7.2	7	4.5	5	4.3	-	-	-	Yes	7
229	VM	977714	88	-	70	68	66	68	70	82	89	76	-	13	10	12	10	8	9	8	-	-	5.6	6	4.2	3.4	4.3	5	4.3	3.5	Yes	8
230	KS	937101	86	-	70	78	70	76	66	82	86	80	-	10	10	9	8	7	6	4	-	-	7	6.4	3.5	3.3	4.9	4.2	4.1	3.9	Yes	7
231	PS	805249	-	-	69	68	65	90	80	84	-	-	-	12	11	9	7	9	8	9	-	-	6	6.1	4.2	3.7	4.1	3.3	-	-	No	-
232	SG	815207	-	-	60	60	61	-	-	-	-	-	-	13	14	9	-	-	-	-	-	-	6	6.2	5	-	-	-	-	-	No	-
233	S	445212	90	-	65	74	66	74	65	73	68	70	-	11	10	8	9	6	5	6	-	-	5.5	6	4.7	3.9	3.9	4.4	3.9	4.3	No	-
234	BS	768596	-	-	65	68	74	67	73	74	76	80	-	6	6	11	10	-	-	-	-	-	6	6.8	5	4	-	-	-	-	Yes	5
235	DR	913007	-	-	62	64	64	85	81	71	-	-	-	14	14	15	10	8	7	-	-	-	7	7.1	5.1	4.5	3.9	4.5	-	-	Yes	7
236	SK	946234	86	-	65	71	65	76	77	78	74	82	-	11	10	9	8	9	7	7	-	-	7.2	7	6.5	5.5	4.2	3.8	3.6	3.4	Yes	6
237	RB	513592	-	-	63	64	65	65	62	60	-	-	-	13	13	12	12	10	9	-	-	-	6.2	6	5.5	4.6	4.4	4	-	-	Yes	8
238	HL	336403	80	-	64	67	62	66	66	67	68	70	-	12	12	11	9	8	7	7	-	-	5.9	7	5	3.7	3.4	5	4.5	3.9	No	-
239	NS	921881	-	-	65	66	64	63	62	58	-	-	-	17	16	14	10	8	7	-	-	-	6.2	6	5	4.7	4.2	3.6	-	-	No	-
240	TK	881091	102	-	63	68	62	66	68	60	70	74	-	10	10	8	10	11	12	11	-	-	5.8	5.6	4.1	3.9	4.2	3.9	4.1	3.2	Yes	4
241	R	816534	84	-	66	85	64	65	66	67	68	64	-	12	12	11	9	8	7	6	-	-	6.8	6	4.9	4.7	3.5	5	3.8	4.6	No	-
242	RC	974519	98	-	70	80	68	67	65	70	74	84	-	11	11	10	11	9	8	9	-	-	5	5.2	4	3.8	4.2	4.1	4.2	4.5	Yes	5
243	JK	943441	-	-	64	64	65	-	-	-	-	-	-	18	15	10	-	-	-	-	-	-	6.2	7	5.6	-	-	-	-	-	No	-
244	AK	713962	-	-	60	60	62	63	62	61	-	-	-	14	14	12	10	9	7	-	-	-	7.2	7	4.2	5.4	4.8	4.4	-	-	Yes	9
245	SS	945102	-	-	64	64	65	62	67	-	-	-	-	16	13	12	10	8	-	-	-	-	5.6	6	5.7	4.8	4.3	-	-	-	Yes	7

Serial no.	Name	MRD	Total days on vasopressors	Cumulative vasopressor dose	Norepinephrine (mcg/min)	Vasopressin (cumulative units)	Dobutamine in grams	Death	ICU type medical-surgical-, cardiovascular /CCU	Survival at 14 days after RRT	14 day mortality rate	14 day mortality rate after RRT	30 day mortality rate	All cause intra hospital mortality rate (last contact)	Days until death	days until discharge	duration of CRRT in hours	Days on RRT (duration of RRT)	Dailysis free days	30 day RRT dependence	RRT switch	RRT Switch to	Serum creat at discharge/last contact in survivors; mg/dl)	Total UF (ML)	Anticoagulation
199	HM	945467	14	-	760	230	3.4	Yes	1	No	Yes	Yes	Yes	Yes	14	-	-	4	10	-	1	1	-	14000	0
200	SR	957722	3	-	700	400	-	No	1	Yes	No	No	No	No	-	19	40	2	17	2	2	-	1.2	14000	0
201	PK	779775	9	-	450	-	5	Yes	1	No	Yes	Yes	Yes	Yes	11	-	78	7	5	-	2	-	-	9000	0
202	RS	810395	8	-	620	-	-	Yes	2	No	No	Yes	Yes	Yes	18	-	-	6	10	-	2	-	-	9500	0
203	RS	925732	3	-	650	140	-	No	2	Yes	No	No	No	No	-	22	30	2	20	2	2	-	0.7	7800	0
204	JS	873705	5	-	600	-	-	Yes	1	Yes	No	No	No	No	-	15	-	5	11	1	1	3	5	8500	0
205	AS	678831	7	-	590	240	8.6	Yes	1	No	Yes	Yes	Yes	Yes	7	-	14	1	-	-	2	-	-	11000	0
206	SD	808067	7	-	490	-	-	Yes	2	No	Yes	Yes	Yes	Yes	11	-	-	3	8	-	2	-	-	7000	0
207	RL	768128	15	-	590	250	-	Yes	1	No	No	Yes	Yes	Yes	26	-	68	10	16	-	1	3	-	9500	0
208	S	875943	5	-	300	-	-	No	1	Yes	No	No	Yes	No	-	16	-	5	11	1	1	1	3.9	10500	0
209	V	937616	10	-	600	360	7	Yes	1	No	Yes	Yes	Yes	Yes	10	-	78	3	-	-	2	-	-	9800	0
210	RD	944591	1	-	330	-	5.1	Yes	1	No	Yes	Yes	Yes	Yes	1	-	16	1	-	-	2	-	-	10000	0
211	AK	896375	7	-	610	160	-	No	1	Yes	No	No	No	No	-	24	-	5	18	1	2	-	5.5	9000	0
212	V	668172	8	-	680	220	-	Yes	1	No	Yes	Yes	Yes	Yes	9	-	-	4	5	-	1	1	-	9500	0
213	RK	262311	8	-	540	-	-	No	1	Yes	No	No	No	No	-	24	-	6	18	2	2	-	2	14500	0
214	A	906507	8	-	390	-	-	No	1	Yes	No	No	No	No	-	29	-	8	21	1	1	1	4	4200	0
215	DS	891980	10	-	690	-	3.4	Yes	1	Yes	No	No	No	No	-	17	-	3	6	2	2	-	1	4800	0
216	PS	934046	7	-	600	280	-	No	1	Yes	No	No	Yes	Yes	-	14	68	4	10	1	1	2	2	11000	0
217	K	470330	6	-	270	-	-	No	1	Yes	No	No	No	No	-	16	-	6	10	2	1	1	1.4	7000	0
218	GK	782276	14	-	650	-	-	Yes	1	No	No	Yes	Yes	Yes	16	-	-	4	12	-	1	3	-	8000	0
219	VM	334615	4	-	550	172	-	No	1	Yes	No	No	No	No	-	17	46	2	15	2	2	-	1.3	12000	0
220	MK	769582	12	-	750	-	5.5	Yes	1	No	Yes	Yes	Yes	Yes	12	-	78	3	9	-	1	3	-	8500	0
221	BS	910962	6	-	425	-	-	No	1	Yes	No	No	No	No	-	18	-	5	13	2	2	-	4	6500	0
222	SD	351356	1	-	690	-	-	Yes	1	No	Yes	Yes	Yes	Yes	1	-	22	1	-	-	2	-	-	12000	0
223	SK	804627	12	-	660	-	-	Yes	2	No	Yes	Yes	Yes	Yes	9	-	-	4	5	-	2	-	-	5600	0
224	SS	465052	5	-	350	-	-	No	2	Yes	No	No	No	No	-	18	-	4	18	2	2	-	1.7	13000	0
225	TL	875357	7	-	470	-	5.5	Yes	1	Yes	No	No	No	No	-	12	-	4	8	2	2	-	1	4000	0
226	A	804852	4	-	290	-	-	No	1	Yes	No	No	No	No	-	18	-	5	13	2	2	-	1.1	4500	0
227	RS	891631	7	-	560	-	-	No	1	Yes	No	No	No	No	-	14	-	5	9	1	2	-	4.8	4900	0
228	KKS	781116	7	-	800	-	4.3	Yes	1	No	Yes	Yes	Yes	Yes	7	-	76	3	4	-	2	-	-	11000	0
229	VM	977714	6	-	600	-	3.5	No	1	Yes	No	No	No	No	-	18	46	2	16	2	2	-	1.1	9000	0
230	KS	937101	6	-	250	-	-	No	1	Yes	No	No	No	No	-	16	50	3	13	2	1	2	1.4	12000	0
231	PS	805249	8	-	700	190	-	Yes	2	No	Yes	Yes	Yes	Yes	10	-	-	2	14	-	2	-	-	5800	0
232	SG	815207	2	-	780	-	-	Yes	1	No	Yes	Yes	Yes	Yes	2	-	30	2	-	-	1	2	-	9500	0
233	S	445212	2	-	675	300	-	No	1	Yes	No	No	No	No	-	21	-	4	17	2	2	-	1.2	7500	0
234	BS	768596	5	-	700	-	8.6	Yes	1	No	Yes	Yes	Yes	Yes	8	-	110	5	3	-	1	3	-	5600	0
235	DR	913007	10	-	750	-	-	Yes	1	No	Yes	Yes	Yes	Yes	11	-	-	4	7	-	1	1	-	3400	0
236	SK	946234	3	-	470	-	-	No	1	Yes	No	No	No	No	-	19	80	4	13	2	2	-	1.4	6500	0
237	RB	513592	10	-	425	160	-	Yes	1	No	No	Yes	Yes	Yes	15	-	74	4	10	-	1	3	-	5600	0
238	HL	336403	3	-	690	-	-	No	2	Yes	No	No	No	No	-	15	-	4	11	2	1	-	1.5	9000	0
239	NS	921881	12	-	640	380	-	Yes	2	No	Yes	Yes	Yes	Yes	10	-	98	4	6	-	2	-	-	7800	0
240	TK	881091	5	-	640	-	-	No	1	Yes	No	No	No	No	-	22	-	5	17	2	1	1	1.4	11000	0
241	R	816534	3	-	650	-	-	No	2	No	No	Yes	Yes	Yes	17	-	-	4	13	-	1	1	-	9500	0
242	RC	974519	7	-	250	-	4	No	1	Yes	No	No	No	No	-	16	40	2	14	2	1	2	1.4	7500	0
243	JK	943441	2	-	610	-	6.9	Yes	1	No	Yes	Yes	Yes	Yes	2	-	34	2	-	-	2	-	-	8000	0
244	AK	713962	10	-	600	230	-	Yes	1	No	Yes	Yes	Yes	Yes	10	-	100	5	5	-	2	-	-	14000	0
245	SS	945102	7	-	640	250	-	Yes	2	No	Yes	Yes	Yes	Yes	7	-	80	3	-	-	2	-	-	3400	0

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The Principal,
DMC, Ludhiana.

Subject: **Approval of Plan of Thesis.**

This is to inform you that the Faculty of Medical Sciences in its meeting held on 29.05.2019 has approved the plan of thesis of **Dr. Abdul Majeed**, a student of your college for **DM Nephrology** along with the names of Supervisor/Co-Supervisor as under:-

Topic Plan of Thesis

Outcome of continuous renal replacement therapy, sustained low efficiency dialysis and acute peritoneal dialysis in hemodynamic unstable patients with acute kidney injury

Supervisor
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The student has to submit the four copies of thesis (along with PDF format) , to the Controller of Examinations, BFUHS, Faridkot, at least six months before the commencement of theory examination, if he/she is otherwise eligible to take the examination. He /She must directed to attach a photocopy of this letter with the forwarding letter while submitting thesis to the University along with the letter of approval of University for change of supervisor/Co-Supervisor, change of topic,(if any).

S P Singh

Dr. S P Singh MS(Oph)
Controller of Examinations

Note :

1. *If any discrepancy found regarding topic of thesis or Supervisor/Co-Supervisor, inform undersigned within one month after issue of this letter.*
2. *The student may submit the thesis as per the schedule already conveyed i.e. for May/June examination 30th Nov of the preceding the year of examination and for Nov/Dec examinations 31st May of the year of examination.*

OUTCOMES OF CONTINUOUS RENAL REPLACEMENT THERAPY, SUSTAINED LOW EFFICIENCY DIALYSIS AND ACUTE PERITONEAL DIALYSIS IN HEMODYNAMIC UNSTABLE PATIENTS WITH ACUTE KIDNEY INJURY

THESIS PROPOSAL

FOR APPROVAL OF SUBJECT OF THESIS TO BE SUBMITTED

IN PARTIAL FULFILMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

Doctorate of Medicine

in

NEPHROLOGY

OF THE

BABA FARID UNIVERSITY OF HEALTH SCIENCES

FARIDKOT

APRIL, 2019

DR ABDUL MAJEED

DEPARTMENT OF NEPHROLOGY

DAYANAND MEDICAL COLLEGE & HOSPITAL, LUDHIANA

ABSTRACT OF PLAN OF THESIS

Title	Outcomes of continuous renal replacement therapy, sustained low efficiency dialysis and acute peritoneal dialysis in hemodynamic unstable patients with acute Kidney injury
For the degree of	D.M Nephrology
Name of the candidate	Dr Abdul Majeed
Supervisor	Dr Vikas Makkar, Professor &Head, Department of Nephrology, DMCH, Ludhiana
Co-supervisor	Dr Gurpreet Singh Wander, Professor & Head, Department of Cardiology, DMCH, Ludhiana Dr Preet Mohinder Singh, Assistant Professor, Department of Nephrology, DMCH, Ludhiana
Institution	Dayanand Medical College & Hospital, Ludhiana
University	Baba Farid University of Health Sciences, Faridkot

Introduction: Development of ARF constitutes an independent risk factor for death in the hospital, and data indicate that early induction of RRT significantly improves the prognosis of affected patients.

Aim of Study: To compare survival outcome in acute Peritoneal dialysis (PD), Continous renal replacement therapy (CRRT) and sustained low efficiency dialysis(SLED) in hemodynamically unstable patients requiring RRT.

Materials & Methods: Detailed history and relevent data of all patients who will receive continuous renal replacement (CRRT), Sustained low efficiency dialysis (SLED) and acute peritoneal dialysis(PD) will be collected. The data will be analysed for diagnosis, type of RRT, and survival outcome in patients at the time of discharge from hospital.

Clinical Significance: To identify an RRT option of choice would potentially have a major impact on clinical procedures. This might be of particular importance in sepsis-induced renal injury and might also affect treatment costs.

Keywords: PD, CRRT, SLED, Sepsis induced renal injury

(Signature)	(Signature)	(Signature)	(Signature)	(Signature)
Candidate	Co-supervisor	Co-supervisor	Supervisor	Principal

CERTIFICATE OF FACILITIES AVAILABLE

This is to certify that the facilities for work on the subject of thesis titled **"OUTCOMES OF CONTINUOUS RENAL REPLACEMENT THERAPY, SUSTAINED LOW EFFICIENCY DIALYSIS AND ACUTE PERITONEAL DIALYSIS IN HEMODYNAMIC UNSTABLE PATIENTS WITH ACUTE KIDNEY INJURY"** exist in the Department of Nephrology, DMC&H, Ludhiana and will be provided to the candidate. We will see that the data being included in the thesis is genuine and is collected by the candidate himself/herself under our supervision and guidance.

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APPROVAL PROFORMA
BY RESEARCH & ETHICAL COMMITTEE
DAYANAND MEDICAL COLLEGE & HOSPITAL, LUDHIANA

Name of candidate	Dr. Abdul Majeed
Department	NEPHROLOGY
Topic of Thesis	**OUTCOMES OF CONTINUOUS RENAL REPLACEMENT THERAPY, SUSTAINED LOW EFFICIENCY DIALYSIS AND ACUTE PERITONEAL DIALYSIS IN HEMODYNAMIC UNSTABLE PATIENTS WITH ACUTE KIDNEY INJURY**
Likely date of appearing in PG examination	August 2021
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Signature of Members of Research Committee with Stamp	**Signature of Members of Ethics Committee with Stamp**
1. HOD Pharmacology	1. HOD Physiology
2. HOD Surgery	2. HOD Pathology
3. HOD Pathology	3. HOD Pharmacology
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Approved: Yes / No

Chairperson
Research Committee

Approved: Yes / No

Chairperson
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PROFORMA FOR REGISTRATION OF SUBJECT FOR DISSERTATION

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4	DATE OF ADMISSION OF COURSE	28 AUGUST 2018
5	TITLE OF THE TOPIC	Outcomes of continuous renal replacement therapy, sustained low efficiency dialysis and acute peritoneal dialysis in hemodynamic unstable patients with acute Kidney injury

6 BRIEF RESUME OF THE INTENDED WORK

6.1 NEED FOR THE STUDY

Acute renal failure (ARF) requiring RRT significantly affects morbidity and mortality of critically ill patients and constitutes a substantial health care burden. Renal replacement therapy (RRT) is commonly requisitioned in critically ill patients either having chronic kidney disease (CKD) or acute kidney injury (AKI) superimposed over any other primary diagnosis. Most of these patients have multiple organ dysfunction, hemodynamic instability, and/or sepsis. RRT acts as a bridge to survival until the underlying comorbidity improves. The various modes of RRT that can be offered to these patients are intermittent hemodialysis (IHD), slow low-efficiency dialysis (SLED), acute peritoneal dialysis (PD), and continuous RRT (CRRT) each with its own pros and cons. Acute PD is simple, cheap, can be done bedside, lack the risks associated with vascular access and anticoagulation with disadvantages of inability to do in patients with recent abdominal surgery, slow solute clearance, and technical failure of the procedure.

CRRT is slow continuous therapy with multiple options of treatment but has disadvantage of anticoagulation, vascular access, high cost, and being labour intensive.

Unlike IHD, CRRT is performed continuously with a typical blood flow of 100 to 300 mL/min and a dialysate flow of 17 to 40 mL/min if a diffusive CRRT modality is used. It is performed most commonly through a venovenous vascular access. The most commonly applied modalities of CRRT are continuous venovenous hemofiltration (CVVH), continuous venovenous hemodialysis (CVVHD), and continuous venovenous hemodiafiltration

(CVVHDF). In CVVH, solute clearance occurs by convection. No dialysate is used. The rate at which ultrafiltration occurs is the major determinant of convective clearance. Intravenous "replacement fluid" is provided to replace the excess volume that is being removed and replenish desired solutes. In CVVHD, solute removal occurs by diffusion. Unlike IHD, the dialysate flow rate is slower than the blood flow rate, allowing small solutes to equilibrate completely between the blood and dialysate. As a result, the dialysate flow rate approximates urea and creatinine clearance. Ultrafiltration is used for volume control. CVVHDF combines the convective solute removal of CVVH and the diffusive solute removal of CVVHD. As in CVVH, the high ultrafiltration rates used to provide convective clearance require the administration of intravenous replacement fluids. Despite increased clearance of middle molecular weight molecules with convective techniques, no study has shown that CVVH or CVVHDF improves patient survival when compared to CVVHD. Since there is insufficient data to recommend one type of CRRT modality over another, the choice of CRRT modality should be based on clinician preference and expertise.

The advantages of CRRT include hemodynamic tolerance caused by slower ultrafiltration and solute removal. The gradual continuous volume removal makes control of volume status easier and allows administration of medications and nutrition with less concern for volume overload. Because it is a continuous modality, there is less fluctuation of solute concentrations over time and better control of azotemia, electrolytes, and acid-base status. It does not raise intracranial pressure like IHD. The main disadvantages of CRRT include access and filter clotting and the consequent need for anticoagulation.

Another disadvantage of CRRT is increased cost and demands on ICU nurse time compared with IHD.

The hybrid modality, sustained low efficiency daily dialysis (SLED), can provide adequate solute control and requires less intensive monitoring and time in comparison to CRRT. This therapy uses conventional hemodialysis machines with lower blood-pump speeds and dialysate flow rates to provide solute and fluid removal slower than IHD but faster than conventional CRRT. Typically, low blood-pump speeds of 200 mL/min and low dialysate flow rates of 300 mL/min for 6 to 12 hours daily is used. This allows improved hemodynamic stability through gradual solute and volume removal as in CRRT. At the same time, SLED is able to provide high solute clearances as in IHD and remove the need for expensive CRRT machines, costly customized solutions, and trained staff. Because they can be done intermittently based on the needs of the patient, they also avoid the interruption of therapy for various diagnostic and therapeutic procedures that may be required in such patients.

All CRRT, SLED and PD are slow continuous therapies with advantage of convective clearance. CRRT, PD, and SLED are less likely to aggravate hemodynamic instability. IHD carries the risks of anticoagulation, complications of vascular access, and worsening of hemodynamic status. In critically ill patients with hemodynamic instability, one can choose from either CRRT or acute PD or SLED in patients who need RRT and have hemodynamic instability because of their inherent virtue of causing least hemodynamic compromise.

All blood-based therapies are associated with risks of vascular access and anticoagulation. The optimal mode of RRT in critically sick and hemodynamic

unstable patients is not known. Most of the studies comparing CRRT, IHD, and very few with acute PD have shown comparable outcomes in different modalities.[1-3] There is a paucity of adequately powered randomized controlled trials (RCTs) in this population for optimal mode of RRT, due to the presence of multiple confounding factors, ethical issues, economic constraints, and suitability of a patient for a particular procedure. We intend to elucidate further the potential impact of initial choice of RRT modality by studying a cohort of critically ill patients with AKI in Nephrology and medical intensive care units of Dayanand Medical College and Hospital Ludhiana.

6.2 REVIEW OF LITERATURE

Acute kidney injury (AKI) requiring renal replacement therapy (RRT) occurs frequently in ICU patients and significantly affects mortality rates.

Acute renal failure (ARF) remains an important determinant for patient outcomes and constitutes a particular burden for healthcare systems worldwide. There is ever increasing need of RRT in intensive care scenario where number of patients with multiple comorbidities, and hemodynamic instability is continuing to increase. Uchino et al. in a multinational, multicenter study found the prevalence of RRT in between 5% and 6% in Intensive Care Units (ICUs), and it was associated with high mortality rate.[4] The mode of RRT and overall outcome in critically ill patients differ according to regional and institutional practices. In a study by George et al., the combined mortality of entire group of CRRT, and PD was 78% in critically sick patients.[3] They also opined that the severity of underlying illness and need of ventilator support are more important determinant of outcome rather than type of RRT. Martin has also predicted mortality rate of 40%–80% in patients with septic shock applying the consensus conference definition.[5] The patients, who are critically sick but hemodynamically stable and they require RRT, are taken for either SLED or CRRT or acute PD at our center depending on the financial constraints.

Acute PD has been used as mode of RRT, for about last seven decades and has saved number of lives. It may be the only possible therapy in neonates and infants where difficulty of appropriate vascular access and lack of miniaturization of HD instrumentation may prevent administration of HD albeit they have large peritoneal surface area making them suitable for PD. PD has

also been found to be effective in hypercatabolic patients.[6,7] George et al. randomized 25 patients each to CRRT and PD group over period of 3 years and demonstrated comparable outcomes with respect to improvement in metabolic parameters.[3] Gabriel et al. also demonstrated comparable survival in PD and daily hemodialysis groups.[7] Uehlinger et al. compared outcomes among ICU patients on IHD and CRRT and found comparable outcomes with regard to survival and overall hemodynamic stability on either of therapy.[8] Extended daily dialysis of duration of more than

6 h but <24 h has shown comparable outcome versus CRRT in a meta-analysis of RCTs; however, former modality was associated with lower mortality risk in meta-analysis of observational studies.[9] CONVINT trial, a single-center trial of CRRT (continuous venovenous hemofiltration) versus IHD and Kitchlu et al. in a cohort study of CRRT versus SLED (8 h session with blood flow rate of 200 ml/min) have demonstrated no difference in outcomes mainly with respect of mortality in any of the therapies in critically ill patients.[10,11]

In critically ill patients with AKI and hemodynamic instability, the initiation of RRT with SLED is not associated with a different short-term risk of death and RRT dependence as compared to the use of CRRT.[11] These findings were robust after adjustment for demographics, comorbidities, illness severity, and baseline renal function and in various sensitivity analyses. These results are congruent with those of previous observational studies. Marshall et al used a time-series approach to examine mortality rates after a unit-wide switch at 3 hospitals from CRRT to SLED (referred to as 'Prolonged Intermittent Renal Replacement Therapy' or PIRRT in that study) with SLED administered using

comparable parameters to those described in this study. The transition to SLED was not associated with increased mortality.[12] Sun et al completed a retrospective analysis of 65 patients treated with CRRT and 80 treated with SLED and also observed no significant difference in 60-day mortality. There was, however, a higher likelihood of RRT independence in the CRRT group.[13]

Two randomized trials have compared SLED and CRRT though their findings do not clearly demonstrate the superiority of either modality. Abe et al randomized 60 patients to SLED or CRRT and found no significant difference in survival to ICU discharge or 30-day survival (whichever occurred first).[14] In-hospital renal recovery was not affected by RRT modality. In the largest clinical trial to compare SLED and CRRT with respect to clinical outcomes, Schwenger et al randomized 232 critically ill patients with AKI to CRRT or SLED and found no difference in survival.[15] Importantly, the mean SLED and CRRT durations achieved were similar at 14.9 ± 4.4 hrs/session and 15.9 ± 4.2 hrs/session, respectively, which are atypical for the modalities being compared. In the study by Kitchlu et al[11], treatment durations for SLED and CRRT differed substantially, (7.10 ± 1.9 hrs and 20.3 ± 5.3 hrs, respectively) and align well with traditional descriptions of SLED and CRRT.[16-18]

It has been hypothesized that after AKI, autoregulation of blood flow is impaired, with susceptibility to further kidney damage as a result of dialysis-related hemodynamic instability.[19,20] CRRT has the purported benefit of improved hemodynamic tolerability compared to IHD.[21-23] Long-term kidney outcomes may also be better among patients who received CRRT.[23-25] Kitchlu et al[11] demonstrated that surviving SLED recipients are not more

likely to remain RRT-dependent as compared to CRRT recipients, although sample size was small. Their findings also demonstrated comparable volume control among SLED and CRRT recipients in the week after RRT initiation and support the findings of previous smaller observational studies.[16]

Since the need for anticoagulation often presents a series of practical challenges in critically ill patients who require RRT, Kitchlu et al finding that the vast majority of SLED sessions could be delivered with no anticoagulation, is compelling. Since clinical outcomes of SLED seem comparable to CRRT, the ability to deliver RRT without the bleeding and metabolic complications of current anticoagulation options commonly used in CRRT (e.g., heparin or regional citrate anticoagulation) may represent a major benefit of SLED. Delivery of SLED predominantly without anticoagulation has not been reported in other studies assessing this modality.[13-15,26]

It is difficult to draw any firm inference from the available evidence regarding choice of RRT in intensive care scenario except that the mode of RRT is not the sole determinant of outcome. The current study can be representative of practical intensive care scenario in hemodynamically unstable patients treated with CRRT or acute PD or SLED.

6.3 AIMS AND OBJECTIVES OF THE STUDY

Outcomes of continuous renal replacement (CRRT), Sustained low efficiency dialysis (SLED) and acute peritoneal dialysis (PD) in hemodynamic unstable patients with acute kidney injury.

7.0 MATERIALS AND METHODS

Patients with AKI with hemodynamic instability requiring RRT, treated in the department of Nephrology and Intensive Care units, at the Dayanand Medical College and Hospital, Ludhiana, will be included in this study, from April 2018 until March 2020. Data of all these patients who will receive continuous renal replacement (CRRT), Sustained low efficiency dialysis (SLED) and acute peritoneal dialysis(PD) at this centre will be collected.

7.1 SOURCE OF DATA

All the data will be collected from hemodynamically unstable patients requiring RRT admitted to Dayanand Medical College and Hospital, Ludhiana.

A full, free, informed consent will be taken from all the patients.

7.2 METHOD OF COLLECTION OF DATA

Inclusion Criteria: During the recruitment, adult (>18 years) patients with acute kidney injury (AKI) with any etiology with hemodynamic instability requiring renal replacement (RRT) will be eligible for inclusion in the study. AKI will be diagnosed by KDIGO diagnostic criteria, on the basis of rise in serum creatinine by >0.3 mg/dl within 48 h period or urine output <0.5 ml/kg/h for 6 hour.

Exclusion criteria: (a) preexisting chronic kidney disease receiving chronic dialysis; (b) kidney-transplant recipients; (c) denial of written informed consent (patient, legal representative, or legal proxy).

Need for RRT is defined as presence of at least one of the following criteria (and will be decided by treating consultant): (a) clinical symptoms of uremia (that is, gastrointestinal symptoms: (for example, nausea, vomiting, diarrhea not explained otherwise; or neurologic symptoms: mental confusion, severe

weakness, seizures/coma not explained otherwise; or evidence of pericardial effusion); (b) persisting oliguria (urinary excretion rate <0.5 ml/kg/min for >12 hours), or anuria (anuria for >12 hours or <0.3 ml/kg/h for >24 hours), despite adequate fluid management; (c) fluid overload not responding to diuretic treatment; (d) blood urea nitrogen (BUN) levels >100 mg/dl or creatinine clearance <0.1 ml/ kg of body weight/min; (e) severe metabolic acidosis (pH <7.2) not responding to conventional treatment; and (f) hyperkalemia not responding to conservative treatment. Sepsis will be diagnosed on the basis of fulfillment of systemic inflammatory response syndrome criteria with confirmed or presumed infection.

All the patients at DMCH Ludhiana receive CRRT on Baxter Prismaflex system multifiltrate machine. Dialysate and substitute is prepackaged. The blood flow rate is kept at 100-150 ml/min, and effluent volume is targeted at about 30ml/kg/h. All the PD are done bedside by trained person. Stiff PD catheters are inserted under aseptic precautions percutaneously. A total of 40–60 exchanges are planned with prepackaged 1.5% dextrose PD fluid, with dwell time of ½ h over 48–72 h period, and subsequently, PD catheters are removed. SLED therapy uses conventional hemodialysis machines with lower blood-pump speeds and dialysate flow rates to provide solute and fluid removal slower than IHD but faster than conventional CRRT. Typically, low blood-pump speeds of 200 mL/min and low dialysate flow rates of 300 mL/min for 6 to 12 hours daily is used. Patients in all three study groups will be allowed to be switched to the other modality in cases of significance medical reasons that is either in cases of severe RRT modality associated complications or whenever the other modality will not be withheld for

significance medical reasons. Typical reasons for switching of RRT modality will be: continuous severe hypotension with requirement of advanced inotropic support or impossibility of maintaining fluid homeostasis, patient immobilization, impossibility of maintaining electrolyte/ acid base homeostasis, impossibility of delivering an adequate dialysis dose, impossibility of performing CVVH without anticoagulation in patients with bleeding complications/repeated filter clotting. Number of changes in RRT modality and respected reasons will be recorded.

The data will be analysed for diagnosis, type of RRT, and survival outcome in patients at the time of discharge from hospital. The primary outcome measure of the study will be survival at 14 days after end of RRT. Secondary outcome measures will include 14-day-, 30-day-, all cause intrahospital mortality, days until death (on ICU), days in ICU/hospital, cumulative fluid removal over 7 days, days on RRT/dialysis-free days, total days on vasopressors/mechanical ventilation, ICU type, correction of acidosis, hyperkalemia and course of disease severity (that is, clinical scores).

Baseline demographics (including hospital/ICU admission day), baseline laboratory data (including baseline blood-gas analyses, urinary output), concomitant diagnoses, and reasons for AKI will be recorded. For assessment of clinical disease severity over time, Sepsis-related Organ Failure Assessment (SOFA) Acute Physiology will be recorded at baseline. Hemodynamic status and the rate of inotrope infusion of the patients will be noted. Hemodynamic status at admission, at start of the RRT mortality, day 1 (24 hours) day 2 (48 hours) and day 3 (72 hours)/stoppage of dialysis will be monitored. Any procedure related complications and duration of the ICU stay

will be noted. Final outcome of the patient will depend upon the successful correction of uremia with blood urea levels <40mg/dL or less than the initial value correction of acidosis having pH ≥ 7.25 or when serum bicarbonate ≥ 15 mEq/L and along with correction of hyperkalemia to the level of ≤ 5.5 mEq/L, along with the clinical clearance of pitting edema, fine basal crackles, improvement of sensorium and hemodynamic stability. Data on respective RRT treatments, changes in RRT modality, necessity for mechanical ventilation or vasopressor support, routine laboratory data (daily until study day 10 and at days 15, 21), and outcome-related data will be recorded daily. Patients will be followed up until 14 days after RRT, withdrawal of consent, or death. Follow-up will be performed by using electronic hospital data-management systems or telephone follow-up.

OUTCOME

It is hypothesized that the mode of renal replaced therapy is not the sole determinant of outcome in hemodynamic unstable patients with acute Kidney injury. The study would help to know the comparative efficacy of outcomes of continuous renal replacement therapy, sustained low efficiency dialysis and acute peritoneal dialysis in hemodynamic unstable patients with acute Kidney injury.

STATISTICAL ANALYSIS

Data will be described in terms of range; mean ±standard deviation (± SD), median, frequencies (number of cases) and relative frequencies (percentages) as appropriate. Comparison of quantitative variables between the study groups will be done using ANOVA. For comparing categorical data, Chi square ($\chi 2$) test was performed and exact test will be used when the

expected frequency is less than 5. A probability value (p value) less than 0.05 will be considered statistically significant. All statistical calculations will be done using SPSS (Statistical Package for the Social Science) SPSS 21 version statistical program for Microsoft Windows.

7.3 DOES THE STUDY REQUIRE ANY INVESTIGATIONS OR INTERVENTIONS TO BE CONDUCTED ON PATIENTS OR OTHER HUMANS OR ANIMALS? IF SO, PLEASE DESCRIBE BRIEFLY.

NO

7.4 HAS ETHICAL CLEARENCE BEEN OBTAINED FROM YOUR INSTITUTION IN CASE OF 7.3?

ATTACHED HEREWITH

LIST OF REFERENCES:

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PROFORMA

Sr.No.

Name Age

MRD No

Father/Husband Name

Address Phone No.

Date of Admission Date of Discharge

Chief Complaints

Diagnosis

Type of RRT

Indication of RRT

PAST HISTORY

DM	HTN	TB	CAD	COPD
CVA	HIV	HBV/HCV	TRAUMA	ANYOTHER

FAMILY HISTORY

PERSONAL HISTORY

Smoking Alcohol Any other drug abuse

Veg/Non Veg

Signature of Candidate **Signature of Supervisor**

General Physical Examination

Pallor	Icterus	Clubbing
Cyanosis	Edema	Lymphadenopathy
Blood pressure	Pulse	JVP

Systemic Examination

Respiratory System

CVS

CNS

Abdomen

Signature of Candidate **Signature of Supervisor**

Date	Day 1	Day 3	Day 5	Day 7	Day 10	Day 14	Day 21	Survival at 14days after RRT	30-day Mortality	Days until hospital discharge (in survivors)
Haematology										
Hb (g/dl)										
TLC(/µl)										
DLC										
Platelets (/µl)										
ESR										
Blood Sugar (F)										
S.creatinine (mg/dl)										
B.urea (mg/dl)										
Sodium(meq/l)										
S. Bicarbonate										
S. Glucose										
S. Lactate										
Ph arterial										
URR										
Potassium(meq/l)										
Calcium(mg/dl)										
Phosphorus(mg/dl)										
Albumin(g/dl)										
Uric Acid(mg/dl)										
SGOT/PT(u/l)										
Total Bilirubin /Direct Bilirubin (mg/dl)										
Total Protein (g/dl)										

Signature of Candidate

Signature of Supervisor

Date	Day 1	Day 3	Day 5	Day 7	Day 10	Day 14	Day 21	Survival at 14days after RRT	30-day Mortality	Days until hospital discharge (in survivors)
Fluids										
0.9% Nacl										
Dextrose 5%										
Lactated Ringer										
½ NS										
Blood transfusion										
Other blood products										
Anticoagulation										
Heparin										
Citrate										
None										
Vasopressors										
Norepinephrine										
Epinephrine										
Dopamine										
Vasopressin										
Clinical Parameters										
Pulse										
SBP										
DBP										
MAP										
UOP										
SOFA Score										
Cumulative Fluid removal										
RRT dependence										
ICU type										
Mechanical ventilation										
Switch to other modality										

Signature of Candidate

Signature of Supervisor

Chest Xray Pa view

ECG

Anti HIV 1 and HIV 2

Hbsg

Anti-HCV

Ultrasound Abdomen (Where Ever applicable)

2-D Echo (Where Ever applicable)

Blood and Body Fluid C/S (Where Ever Applicable) :-

	Date	Organism	Sensitivity
ANA			
ANCA			
C3			
C4			

Signature of Candidate

Signature of Supervisor

Comorbid	CRRT	SLED	Acute PD
Atherosclerosis/ ischemic HF/ AMI			
Congestive heart Failure			
Arterial hypertension			
Obstructive pulmonary disease			
Diabetes mellitus			
Neurologic/ psychiatric. Post stroke			
Malignancy (solid/ hematologic)			
Pancreatitis			
Postresuscitation			
Posttransplantation			
Chronic viral infection			

ETIOLOGY OF AKI

1. Dehydration
2. Tropical fever
3. Toxin – snake bite
4. NEPHROTOXIC DRUGS/ Alternative medication/ industrial-occupation exposure

   Name of drug Date of Starting
5. Obstructive uropathy
6. Obstetric causes
7. SEPSIS
8. ANY OTHER

Signature of Candidate **Signature of Supervisor**

KDIGO STAGE

TREATMENT MODALITY:-

SLED CRRT Acute PD

OUTCOME

Death Yes/No, if Yes, Date - Cause-

Length of ICU stay

Length of Hospital stay

Time to taper off Inotropes

AKI Recovered

AKI Partial Recovered

AKI Not Recovered/Dialysis Dependent

Shift to other modality

Reason of switching

Discharge/ LAMA/Expired

READMISSION WITH IN 30 DAYS OF DISCHARGE

Date Diagnosis

Signature of Candidate **Signature of Supervisor**